13 July, 2007

INTERNATIONAL GLOBAL H-MODE CONFINEMENT DATA BASE
Version DB4v5 Variables.

***Recommended ASCII format for* DB4v5**

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Introduction

The time averaging for the majority of data is ± 2 ms for ASDEX, ± 50 - 100 ms for ASDEX Upgrade, 20-340 ms for Alcator C-mod (0.3 - 5 TAUTH), ±1 ms for COMPASS-D, ± 5 ms for DIII-D, ± 100 ms for JET, ± 2.5 ms for JFT-2M, ±25 ms for JT-60U, ± 3.75 ms for PBX-M, ± 5 ms for PDX, - 5 ms for TCV, ±

50 - 100 ms for TEXTOR, **±??? ms for TFTR, ±??? ms for TdeV,** ±1 ms for START, ±1 ms for T-10, ± 0.5 ms for TUMAN-3M, ±2.5 ms for MAST, ± 150 ms for NSTX**.**

MHD analysis from Alcator C-mod, COMPASS-D, DIII-D, JET (shots from 1994 onwards) and START use a full equilibrium fit (EFIT). PDX and TUMAN-3M use a full equilibrium MHD fit for representative discharges. Data from ASDEX, JET (shots before 1994), JFT-2M, PBX-M and TFTR are obtained with a current filament approach except for some of the JFT-2M variables (RMAG, Q95, $b_I + 0.5\, l_i$, b_p, BT, W) which are calculated with a full equilibrium fit. ASDEX Upgrade use a full equilibrium code fit based on function parameterisation. JT-60U (ELMy H-mode data) use a full equilibrium code fit based on function parameterisation putting q(0) = 1. T-10 data are obtained with ASTRA equilibrium solver using 3-moment approach (G. Pereverzev, P.N. Yushmanov, ASTRA Automated System for Transport Analysis in a Tokamak, IPP 5/98, February 2002). The MHD analysis from TCV uses a free boundary equilibrium reconstruction code (LIUQE) based on magnetic measurements. Thomson and diamagnetic loop data could, but have not been used. For the equilibrium in TEXTOR a very simple shifted circles approach is used. **TdeV, MAST, NSTX ?????.**

In the list of variables the abbreviation **Na** is used if a variable is not available. The normal level of accuracy of a variable is given as a percentage in brackets (often without further explanation). Some variables are combinations of other variables; in these cases, the uncertainty in the resultant variable, which is the appropriate combination of uncertainties in the basis variables, is denoted by **Co**.

General

1. TOK: This variable designates which tokamak has supplied the data.
Possible values are:

TOK	Address on the WEB	TOK_ID
ASDEX	ASDEX, IPP-Garching Germany	**1**
AUG	ASDEX Upgrade, IPP-Garching Germany	**2**
CMOD	Alcator C-mod, MIT USA	**3**
COMPASS	COMPASS-D, Culham UK	**4**
D3D	DIII-D, GA USA	**5**
JET	JET, EURATOM UK	**6**
JFT2M	JFT-2M, JAERI Japan	**7**
JT60U	JT-60U, JAERI Japan	**8**
PBXM	PBX-M, PPPL USA	**9**
PDX	PDX, PPPL USA	**10**
TCV	TCV, EURATOM Switzerland	**11**
TEXTOR	TEXTOR, EURATOM Germany	**12**
TFTR	TFTR, PPPL USA	**13**
TDEV	TdeV, Montreal, Canada	**14**
START	START, Culham, UK	**15**
T10	T10, Kurchachov Institute, Russia	**16**
TUMAN3M	TUMAN-3M, Ioffe Institute, Russia	**17**

MAST	MAST, Culham UK	**18**
NSTX	NSTX, PPPL, USA	**19**

2. TOK_ID: This integer variable designates which tokamak has supplied the data. Possible values are listed in table for TOK.

3. DIVNAME: Describes each device's divertor configuration

TOK	Possible values	
ASDEX	**DV-IPRE** **DV-IPOST** **DV-II-O (no data)** **DV-II-C**	1 <= SHOT <= 13583 13584 <= SHOT <= 20282 20283 <= SHOT <= 25776 25777 <= SHOT
AUG	**DIV-I** **DIV-II** **DIV-IIb**	4670 <= SHOT <= 8609 9825 <= SHOT <= 13622 15024 <= SHOT
CMOD	**NONAME**	
COMPASS	**DIV1**	
D3D	**OPEN** **ADP** **RDP**	56348 <= SHOT <= 69648 70678 <= SHOT <= 90768 98889 <= SHOT
JET	**MARK0** **MARKI** **MARKIIA** **MARKIIAP** **MARKGB** **MARKGBSR**	SHOT < 27968 28792 < SHOT < 35779 35953 < SHOT < 38912 38983 < SHOT < 45081 45202 < SHOT <= 55125 55125 < SHOT
JFT2M	**NONAME**	
JT60U	**NONAME**	
PBXM	**NONAME**	
PDX	**NONAME**	
TCV	**OPEN**	
TEXTOR	**NONAME**	
TFTR	**NONAME**	
TDEV	**NONAME**	
START	**OPEN**	

T10	NONAME
TUMAN3M	NONAME
MAST	RIB (sketch) PLATES1
NSTX	NONAME

4. LCUPDATE: The date of the most recent update for any variable listed in the database. The format is YYYYMMDD (Year-Month-Day).

5. DATE: The date the shot was taken. The format is YYYYMMDD (Year-Month-Day).

6. SHOT: The shot from which the data are taken.

7. TIME: Time during the shot at which the data are taken in seconds.

8. TIME_ID: Integer equivalent of TIME, defined as INT[1000 ´ ROUND{TIME, 0.001}] where INT is the integer part and ROUND rounds TIME to the 3rd decimal place.
Except for TUMAN-3M where INT[100000 ´ ROUND{TIME, 0.00001}] is used.

9. T1: Start of main time average window in seconds.

10. T2: End of main time average window in seconds.

11. AUXHEAT: Type of auxiliary heating.
Possible values are:

NONE	No Auxiliary heating
NB	Neutral Beam Injection
IC	Ion Cyclotron Resonance Heating
EC	Electron Cyclotron Resonance Heating
ECOA	Electron Cyclotron Resonance Heating (Off-axis)
ECIC	Combined ECRH + ICRH
NBEC	Combined NBI + ECRH
NBIC	Combined NBI + ICRH
NBECIC	Combined NBI + ECRH + ICRH

12. PHASE: The phase of the discharge at TIME.
Possible values are:

OHM	Ohmic
L	L-mode
RI	Radiative I-mode
LHLHL	H-mode with frequent LH transitions
H	ELM-free H-mode
HSELM	H-mode with small ELMs
HSELMH	H-mode with high frequency small ELMs
HGELM	H-mode with large ELMs
HGELMH	H-mode with high frequency large ELMs
H???	ELM-free H-mode to be confirmed
HGELM???	H-mode with large ELMs to be confirmed

13. HYBRID: Hybrid discharge indicator .
Possible values are:

NO	Not a Hybrid discharge
YES	Hybrid discharge
IH	Improved H-mode (AUG)
HYBRID	Hybrid H-mode (DIII-D)
UNKNOWN	Not checked for HYBRID properties

14. ITB: Internal Transport Barrier indicator.
Possible values are:

NOITB	No ITB's - (no data)
PREITB	Before ITB onset - (no data)
ITB	ITB present - (no data)
UNKNOWN	Not checked for ITB

15. ITBTYPE: Type of Internal Transport Barrier.
Possible values are:

NONE	No ITB - (no data)
TI	Ti ITB - (no data)
TE	Te ITB - (no data)
NE	ne ITB - (no data)
TITENE	ITB's in Te, Ti and ne - (no data)
NA	Not applicable

16. ELMTYPE: Type of ELMs.
Possible values are:

NONE	No ELMs
TYPE-I	Type I ELMs
TYPE-II	Type II ELMs (no data)
TYPE-III	Type III ELMs
TYPE-V	Type V ELMs
TYPE-1+2	Mixed Type I and Type II ELMs
TYPE-1+5	Mixed Type I and Type V ELMs
TYPE-RF	ICRH ELMs on JET
UNKNOWN	Type has not been determined

17. ELMFREQ: The ELM frequency in Hertz.
JT60U: Average over 400-500 msec.
Normal level of accuracy is
ASDEX (Na), AUG (Na), CMOD (Na), COMPASS (Na), D3D (Na), JET (regular ELMS: ±1%, irregular ELMs: 50%), JFT2M (Na), JT60U (Average of 400-500 msec), PBXM (Na), PDX (Na), TCV (±1%), TEXTOR (Na), TFTR (Na), **TDEV (±???%)**, START (Na), T10 (Na), TUMAN3M (Na), MAST (Na).

18. ELMMAX: The average ELM amplitude of the H-alpha signal (minus base level) in arbitrary units.
Normal level of accuracy is
ASDEX (Na), AUG (Na), CMOD (Na), COMPASS (Na), D3D (Na), JET (±20%), JFT2M (Na), JT60U (Na), PBXM (Na), PDX (Na), TCV (Na), TEXTOR (Na), TFTR (Na), **TDEV (±???%)**, START (Na), T10 (Na), TUMAN3M (Na), MAST (Na).

19. ELMDUR: The average ELM duration of the H-alpha signal in seconds.
Normal level of accuracy is
ASDEX (Na), AUG (Na), CMOD (Na), COMPASS (Na), D3D (Na), JET (±20%), JFT2M (Na), JT60U (Na), PBXM (Na), PDX (Na), TCV (Na), TEXTOR (Na), TFTR (Na), **TDEV (±???%)**, START (Na), T10 (Na), TUMAN3M (Na), MAST (Na).

20. ELMINT: The average ELM integral of the H-alpha signal (minus base level) in arbitrary units.
Normal level of accuracy is
ASDEX (Na), AUG (Na), CMOD (Na), COMPASS (Na), D3D (Na), JET (±20%), JFT2M (Na), JT60U (Na), PBXM (Na), PDX (Na), TCV (Na), TEXTOR (Na), TFTR (Na), **TDEV (±???%)**, START (Na), T10 (Na), TUMAN3M (Na), MAST (Na).

21. OLTIME: The time of the Ohmic to L-mode transition (start of auxiliary heating) in seconds.

22. LHTIME: The time of the L to H transition in seconds.

23. TPI: Time point indicator (ASDEX only).
Possible values are:

0	Indicator not used
1-3	Ohmic points
4	L-mode
5-7	H-mode points up to the time at which DWDIA = 0
8-9	Extra H-mode points - (no data)

24. ISEQ: Parameter scan identifier

Possible options for ASDEX are:

Toroidal magnetic field scans	**BT1, BT2P4, BT3, BT4, BT5, BT6, BT7**
High beta investigations, Ti profile measurements	**HBE1, HBE2, HBE3**
QCYL scan	**QC1P3**
Search for long ELM-free periods	**EF11**
Density variation	**NE1**
Spectroscopic investigations	**SP11**
Power scans (PNBI)	**P1, P2, QC1P3, BT2P4**
Comparison shots for helium program	**G1**
Search for high confinement times	**HT1**
No scan	**NONE**

Possible options for AUG are:

Confinement identity AUG/DIII-D	**AUG_DIIID**

Confinement identity AUG/JET	**AUG_JET**
Confinement identity AUG/CMOD	**AUG_CMOD**
Current scan	**IP1**
IP, BT and power scan	**IPBTP1**
Power and density scan nr. 1	**PNE1**
Power and density scan nr. 2	**PNE2**
Power and density scan nr. 3	**PNE3**
Power and density scan nr. 4	**PNE4**
Pellet scan	**PELLET**
	IHMODE
No scan	**NONE**

Possible options for CMOD are :

No scan	**NONE**

Possible options for COMPASS are :

No scan	**NONE**

Possible options for D3D are:

Elongation scans	**KAPPA1, KAPPA2, KAPPA3**
L-mode rho* scans	**LRHO1, LRHO2, LRHO3**
H-mode rho* scans	**HRHO1, HRHO2, HRHO3, RHOSCAN**
Nu* scans	**LNU1, HNU1**
Beta scans	**LBETA1, HBETA1**
q scans	**QSCAN**
Rho* scaling from DIII-D/JET comparison	**JET1, JETSIMILAR**
High density, good confinement with pellets	**HINE**
Reference shot without gas puff	**HI_GP_REF**
High density, good confinement with gas puff	**HI_GP**
The ratio of Te/Ti was varied	**TETISCALE**
No scan	**NONE**

Possible options for JET are:

Tokamak identity scans	DIIID, D3D1, AUG, CMOD, CMOD1, JT60U, ITER, ITER/LL, ITER/LU, ITER-LIKE
L-mode rho* scans	**LRHO1, LRHO2, LRHO3 (no data)**
H-mode rho* scans	RHO1, RHO2, RHO3, RHO4, LOW-RHO
Nu* scans	NU1
Beta scans	BETA1, HIGH-BETA
Configuration scans	H/SFE/VLT, H/SFE/LT, H/SFE/HT, H/SFE/VHT, H/SFE/VH, H/SFE/?? H/LFE/HT H/HFE/LT, H/HFE/HT, H/HFE/?? HC/SFE/LT HK/LT/99, HK/HT/99 LK/LT/99 V/SFE/LTS, V/SFE/LT, V/SFE/HT, V/SFE/VHT V/SFE/VH, V/SFE/EH V/HFE/LT, V/HFE/HT V/LFE/LT C/SFE/LT, C/SFE/HT SEPTUM, S/SFE/LT, S/SFE/HT HC, HC/HT, HIGHCL, DNX, HT3
	DOC-U, DOC-L, DOC-LL
No scan	**NONE**

Possible options for JFT2M are:

Gas scans: Intense gas puff for comparison with Hydrogen pellet H-mode Intense gas puff for comparison with Deuterium pellet H-mode Intense gas puff in Hydrogen Intense gas puff in Deuterium	**G1 G2 G3IP2 G4IP3**
Current scans: BT = 1.25T Hydrogen plasma Deuterium plasma	**IP1 IP2 IP3**
Power scans (PNBI): CO or CTR with IP = 0.25MA CO + CTR with IP = 0.24MA	**P1 P2**
Density scans (NEL): Hydrogen Deuterium	**P3IP4NE1 P4IP5NE2**
Toroidal field scans: IP = 0.16MA IP = 0.21MA	**BT1 BT2**
Pellet scans: Hydrogen pellet into Hydrogen Deuterium pellet into Deuterium	**PE1 PE2**
ENBI scans: BSOURCE = 603010 BSOURCE = 801010	**EB1 EB2**

AMIN scan with IP = 0.22MA (same Q95)	**AM1**
Scan of 801010 (CO or CTR) and 603010 (CO or CTR)	**BS1**
IEML and PNBI scan looking for steady state H-mode region	**IE1**
XPLIM scan with IP = 0.24MA	**XP1**
No scan	**NONE**

Possible options for JT60U are :

No scan	**NONE**
Beta scan data	**BETA**

Possible options for PBXM are :

No scan	**NONE**

Possible options for PDX are :

No scan	**NONE**

Possible options for TCV are :

No scan	**NONE**

Possible options for TEXTOR are:

Search for high confinement times	**HT1**
No scan	**NONE**

Possible options for TFTR are :

No scan	**NONE**

Possible options for TDEV are :

No scan	**NONE**

Possible options for START are :

No scan	**NONE**

Possible options for T10 are :

No scan	**NONE**

Possible options for TUMAN3M are :

No scan	**NONE**

Possible options for MAST are :

No scan	**NONE**

Possible options for NSTX are :

No scan	**NONE**

Plasma composition

25. MEFF: Effective atomic mass in AMU.
Based on concentration measurements in JET, START and TFTR or calculated as
= 0.5 (PGASA + 0.5 (BGASA + BGASA2)) if PINJ > 0 and PINJ2 > 0.
= 0.5 (PGASA + BGASA) if only PINJ > 0.
= PGASA otherwise.
JET: A few Ohmic observations PNBI <= 3 kW. For these observations MEFF = PGASA.
Normal level of accuracy is
ASDEX (±10%), AUG (±20%), CMOD (±3%), COMPASS (±10%), D3D (pure gas: ±1% , mixed gas: ±20%), JET (±20%), **JFT2M (±???%)**, JT60U (±5%), PBXM (±25%), PDX (±25%), TCV (±0%), **TEXTOR (±???%)**, TFTR (±0.2), TDEV (±10%), START (±50%), T10 (±10%), TUMAN3M (±5%), **MAST (±???%)**.

26. PGASA: Mass number of the plasma working gas (real value).
Possible values are:

1	Hydrogen
2	Deuterium
2.5	Deuterium and Tritium
3	^{3}He or Tritium
4	^{4}He
14.01	Nitrogen

27. PGASZ: Charge number of the plasma working gas (integer value).
Possible values are:

1	Hydrogen, Deuterium or Tritium
2	Helium
7	Nitrogen

28. BGASA: Mass number of the neutral beam gas (real value).
Possible values are:

0	When PINJ = 0
1	Hydrogen
2	Deuterium
3	^{3}He or Tritium
4	^{4}He

29. BGASZ: Charge number of the neutral beam gas (integer value).
Possible values are:

0	When PINJ = 0
1	Hydrogen, Deuterium or Tritium
2	Helium

30. BGASA2: Mass number of the second neutral beam gas (real value).
Possible values are:

0	When PINJ2 = 0
1	Hydrogen
2	Deuterium
3	^{3}He or Tritium
4	^{4}He

31. BGASZ2: Charge number of the second neutral beam gas (integer value).
Possible values are:

0	When PINJ2 = 0
1	Hydrogen, Deuterium or Tritium
2	Helium

32. PELLET: Pellet material if a pellet(s) has been injected.
Possible values are:

NONE	No pellets
H	Hydrogen pellet(s)
D	Deuterium pellet(s)
GP_H	Strong Hydrogen gas fuelling
GP_D	Strong Deuterium gas fuelling
GAS-FUEL	Strong gas fuelling (JET)

33. FUELRATE: Fuel rate in electrons per second of extra gas.
Normal level of accuracy is
ASDEX (Na), AUG (±20%), CMOD (Na), COMPASS (Na), D3D (Na), JET (±20%), JFT2M (Na), JT60U (Na), PBXM (Na), PDX (Na), TCV (Na), TEXTOR (Na), TFTR (Na), TDEV (Na), START (Na), T10 (Na), TUMAN3M (Na), MAST (Na).

34. XGASZ: Atomic Charge of extra fuelled gas.
Possible values are:

0	No extra fuelled gas
1	Hydrogen
2	Helium
7	Nitrogen
10	Neon
16	Sulfur - should this be 14 for Silicon?
18	Argon
36	Krypton

35. XGASA: Atomic Mass of extra fuelled gas.
Possible values are:

0	No extra fuelled gas
1	Hydrogen
2	Deuterium
3	Tritium / Helium
4	Helium

~ 14	Nitrogen
~ 20.18	Neon
28	Silicon
~ 39.95	Argon
83.8	Krypton

Geometry

36. CONFIG: The plasma configuration.
Possible values are:

SN	Single null
SN(L)	Single null with the x-point at the bottom of the machine
SN(U)	Single null with the x-point at the top of the machine
DN	Double null
DND	Double null divertor
IW	Inner wall.
LIM	Outboard limiter
BOT	Limited on bottom of vessel
TOP	Limited on top of vessel
MAR	Marginally diverted/limited

Tokamak details:

TOK	SN	SN(L)	SN(U)	DN	DND	IW	LIM	BOT	TOP	MAR
ASDEX	´			´						
AUG		´								
CMOD	´			´			´			
COMPASS	´									
D3D	´	´	´	´		´		´	´	´
JET	´	´		´		´				
JFT2M	´			´						
JT60U	´									
PBXM				´						

PDX	´									
START					´					
T10								´		
TCV		´	´							
TDEV	´									
TEXTOR							´			
TFTR							´			
TUMAN3M							´			
MAST				´						
NSTX		´								

ASDEX: DN if vertical shift DZ is less than 5 mm, otherwise SN.
D3D: DN if two nulls and the separatrix flux surface are inside the divertor tiles and on the same flux surface within 0.25 cm.
JFT2M: DN if two nulls are inside the limiter.

37. RGEO: The plasma geometrical major radius in meters, from an MHD equilibrium fit, defined as the average of the minimum and the maximum radial extent of the plasma.
Normal level of accuracy is
ASDEX (±1%), AUG (±0.5%), CMOD (±0.6%), COMPASS (±1cm), D3D (±0.6%), JET (±1%), JFT2M (±0.75%), JT60U (±0.5%), PBXM (±0.65%), PDX (±0.75%), TCV (±1%), TEXTOR (±0.5%), TFTR (±1cm), TDEV (±0.5cm), START (±2cm), T10 (±1%), TUMAN3M (±2%), **MAST (±???%)**.

38. RMAG: The major radius of the magnetic axis in meters from an MHD equilibrium fit.
ASDEX: Formula based on a number of equilibriums.
Normal level of accuracy is
ASDEX (±1%), AUG (±1%), CMOD (±1%), COMPASS (Na), D3D (±1%), JET (±2%), JFT2M (±2%), JT60U (±0.5%), PBXM (±1%), PDX (±4%), TCV (±1%), TEXTOR (±2%), TFTR (±4cm), TDEV (±2%), START (Na), T10 (±1%), TUMAN3M (Na), MAST (Na).

39. AMIN: The horizontal plasma minor radius in meters from an MHD equilibrium fit.
ASDEX: Formula based on a number of equilibriums.
Normal level of accuracy is
ASDEX (±1.5%), AUG (±1%), CMOD (±2%), COMPASS (±1cm), D3D (±0.5%), JET (±3%), JFT2M (±3%), JT60U (±1%), PBXM (±3%), PDX (±3%), TCV (±2%), TEXTOR (±3%), TFTR (±1cm), TDEV (±5%), START (±2cm), T10 (±3%), TUMAN3M (±3%), **MAST (±???%)**.

40. KAPPA: The plasma elongation determined from an MHD equilibrium fit.
ASDEX: Formula based on a number of equilibriums.
PDX: $k = 1$ for all records.
Normal level of accuracy is
ASDEX (±2%), AUG (±1%), CMOD (±1%), COMPASS (±10%), D3D (±1%), JET (±5%), JFT2M (±10%), JT60U (±2%), PBXM (±10%), PDX (±10%), TCV (±2%), TEXTOR (±4%), TFTR (±0.04), TDEV (±2%), START (±10%), T10 (±5%), TUMAN3M (±5%), **MAST (±???%)**.

41. KAPPAA: New plasma elongation definition (= AREA / (π $AMIN^2$))
COMPASS: AREA is approximated by VOL / (2π RGEO).
Normal level of accuracy is
ASDEX (Co), AUG (Co), CMOD (Co), COMPASS (Co), D3D (Co), JET (Co), JFT2M (Co), JT60U (Co), PBXM (Co), PDX (Co), TCV (Co), TEXTOR (Co), TFTR (Co), TDEV (Co), START (Co), T10 (Co), TUMAN3M (Co), MAST (Co).

42. KAREA: New plasma elongation definition (= VOL / (2π RGEO) / (π $AMIN^2$))
Normal level of accuracy is
ASDEX (Co), AUG (Co), CMOD (Co), COMPASS (Co), D3D (Co), JET (Co), JFT2M (Co), JT60U (Co), PBXM (Co), PDX (Co), TCV (Co), TEXTOR (Co), TFTR (Co), TDEV (Co), START (Co), T10 (Co), TUMAN3M (Co), MAST (Co).

43. DELTA: The triangularity of the plasma boundary from an MHD equilibrium fit.
Normal level of accuracy is
ASDEX (±3%), AUG (±10%), CMOD (±3%), COMPASS (±10%), D3D (±10%), JET (±10%), JFT2M (±10%), JT60U (±5%), PBXM (±25%), PDX (Na), TCV (±3%), TEXTOR (Na), TFTR (Na), TDEV (±10%), START (±10%), T10 (Na), TUMAN3M (Na), MAST (Na).

44. DELTAU: Upper triangularity of the plasma boundary from an MHD equilibrium fit.
Normal level of accuracy is
ASDEX (Na), AUG (±10%), CMOD (±2%), COMPASS (±10%), D3D (±10%), JET (±10%), JFT2M (Na), JT60U (Na), PBXM (Na), PDX (Na), TCV (±3%), TEXTOR (Na), TFTR (Na), TDEV (±10%), START (±10%), T10 (Na), TUMAN3M (Na), MAST (Na).

45. DELTAL: Lower triangularity of the plasma boundary from an MHD equilibrium fit.
Normal level of accuracy is
ASDEX (Na), AUG (±10%), CMOD (±1%), COMPASS (±10%), D3D (±10%), JET (±10%), JFT2M (Na), JT60U (Na), PBXM (Na), PDX (Na), TCV (±3%), TEXTOR (Na), TFTR (Na), TDEV (±10%), START (±10%), T10 (Na), TUMAN3M (Na), MAST (Na).

46. INDENT: Indentation of the plasma determined from an MHD equilibrium fit.
Normal level of accuracy is
ASDEX (Na), AUG (Na), CMOD (Na), COMPASS (Na), D3D (Na), JET (Na), JFT2M (Na), JT60U (Na), PBXM (± 15%), PDX (Na), TCV (Na), TDEV (Na), TFTR (Na), TDEV (Na), START (Na), T10 (Na), TUMAN3M (Na), MAST (Na).

47. AREA: Area of plasma cross section in m^2 determined from an MHD equilibrium fit.
ASDEX: Formula based on a number of equilibriums.
Normal level of accuracy is
ASDEX (±2%), AUG (±3%), CMOD (±3%), COMPASS (Na), D3D (±3%), JET (±6%), JFT2M (±5%), JT60U (±5%), PBXM (±10%), PDX (±5%), TCV (±1%), TEXTOR (±5%), TFTR (±5%), TDEV (±5%), START (±10%), T10 (±6%), TUMAN3M (±6%), **MAST (±???%)**.

48. VOL: The plasmas volume in m^3 determined from an MHD equilibrium fit.
ASDEX: Formula based on a number of equilibriums.
Normal level of accuracy is
ASDEX (±3%), AUG (±3%), CMOD (±3%), COMPASS (±10%), D3D (±3%), JET (±6%), JFT2M (±5%), JT60U (±2%), PBXM (±10%), PDX (±5%), TCV (±1%), TEXTOR (±5%), TFTR (±6%), TDEV (±1%), START (±10%), T10 (±7%), TUMAN3M (±8%), **MAST (±???%)**.

49. SEPLIM: The minimum distance between the separatrix flux surface and either the vessel wall or limiters in meters from an MHD equilibrium fit.
ASDEX: Formula based on a number of equilibriums.
Normal level of accuracy is
ASDEX (±1cm), AUG (Na), CMOD (±0.5cm), COMPASS (Na), D3D (±0.5cm), JET (±1cm), JFT2M (±1cm), JT60U (±1cm), PBXM (±0.5cm), PDX (±1cm), TCV (±2%), TEXTOR (±0.5cm), TFTR (Na), TDEV (±0.5cm%), START (Na), T10 (Na), TUMAN3M (Na), MAST (Na).

50. XPLIM: The minimum distance between the X-point and either the vessel walls or limiters in meters from an MHD equilibrium fit. The value is positive if X-point is inside either the vessel wall or limiters.
Normal level of accuracy is
ASDEX (Na), AUG (Na), CMOD (Na), COMPASS (Na), D3D (±3cm), JET (±5cm), JFT2M (±3cm), JT60U (±2cm), PBXM (±5cm), PDX (±5cm), TCV (±2%), TEXTOR (Na), TFTR (Na), TDEV (±1cm%), START (Na), T10 (Na), TUMAN3M (Na), MAST (Na).

Machine condition

51. WALMAT: The material of the vessel wall.
Possible values are:

C	Carbon
SS	for Stainless Steel
IN	for Inconel
IN/C	for Inconel with Carbon
CSS	for (partly) Carbon on Stainless Steel.
AL	for Aluminum

52. DIVMAT: The material of the divertor tiles.
Possible values are:

SS	for Stainless Steel
C **CC**	for Carbon
TI1 **TI2**	for Titanium,
BE	for Beryllium

C/BE	for Carbon at the top and Beryllium at the bottom
W	for Wolfram
MO	for Molybdenum
IN	for Inconel
NONE	for no Divertor

53. LIMMAT: The material of the limiters.
Possible values are:

C	for Carbon
BE	for Beryllium
MO	for Molybdenum
NONE	for no Limiter

54. EVAP: The evaporated material used to cover the inside of the vessel.
Possible values are:

BOR **BO**	for Boron
BOROA	for Boron (B_2H_6 + CH_4 + H_2)
BOROB	for Boron (B_2H_6 + H_2)
BOROC	for Boron
BOROX	for Boron
B2D6	for Boron
CARB	for Carbon
CARBH	for Carbon (CH_4 + D_2)
CARBORANE	for Orto-Carborane ($C_2B_{10}H_{12}$) into He Glow
DECABORA	???
TI	for Titanium
BE	for Beryllium
SILICON	for Silicon
SID4	for Silicon
NONE	for no evaporation
	JET to repair

55. DALFMP: D_a emission on the midplane.
Normal level of accuracy is
ASDEX (Na), AUG (±20%), CMOD (Na), COMPASS (Na), D3D (Na), JET (±20%), JFT2M (Na), JT60U (Na), PBXM (±5%), PDX (±5%), TCV (Na), TEXTOR (Na), TFTR (Na), TDEV (Na), START (Na), T10 (Na), TUMAN3M (Na), MAST (Na).

56. DALFDV: D_a emission in the divertor.
Normal level of accuracy is
ASDEX (Na), AUG (Na), CMOD (Na), COMPASS (Na), D3D (Na), JET (±20%), JFT2M (Na), JT60U (Na), PBXM (±5%), PDX (±5%), TCV (Na), TEXTOR (Na), TFTR (Na), TDEV (Na), START (Na), T10 (Na), TUMAN3M (Na), MAST (Na).

Magnetics

57. IGRADB: Indicates, when CONFIG = SN, whether the ion Ñ B drift is towards (= **1**) or pointing away from (= **-1**) the X-point.

58. BT: The vacuum Toroidal magnetic field in Tesla at RGEO determined from the TF coil current.
AUG: Normally negative BT values.
CMOD: Normally negative BT values.
JET: Negative BT values indicate operation with reversed Toroidal field.
MAST: Normally negative BT values.
Normal level of accuracy is
ASDEX (±1%), AUG (±1%), CMOD (±1%), COMPASS (±2%), D3D (±1%), JET (±1%), JFT2M (±1%), JT60U (±1%), PBXM (±1%), PDX (±1%), TCV (±1%), TEXTOR (±1%), TFTR (±2%), TDEV (±1%), START (±6%), T10 (±1%), TUMAN3M (±3%), **MAST (±???%)**.

59. IEML: Ergodic magnetic field coil current in Amperes.
Normal level of accuracy is
ASDEX (Na), AUG (Na), CMOD (Na), COMPASS (Na), D3D (Na), JET (Na), JFT2M (± 1%), JT60U (Na), PBXM (Na), PDX (Na), TCV (Na), TEXTOR (Na), TFTR (Na), TDEV (Na), START (Na), T10 (Na), TUMAN3M (Na), MAST (Na).

60. PREMAG: Indicates if startup was done with (= **YES**) or without (= **NO**) pre-magnetization current.
JET: If PREMAG = NO for pre 94 shots then WMHD is missing.

61. IP: The plasma current in Amperes determined from an external Rogowski loop with vessel current subtraction.
CMOD: Normally negative IP values.
JET: Normally negative IP values. Positive IP values indicate operation with reversed current.
TDEV: Normally negative IP values.
Normal level of accuracy is
ASDEX (±1%), AUG (±1%), CMOD (±2%), COMPASS (±1%), D3D (±1%), JET (±1%), JFT2M

(±1%), JT60U (±0.5%), PBXM (±1%), PDX (±1%), TCV (±1%), TEXTOR (±1%), TFTR (±2%), TDEV (±2%), START (±2%), T10 (±1%), TUMAN3M (±3%), **MAST (±???%)**.

62. VSURF: The loop voltage at the plasma boundary in volts.
Normal level of accuracy is
ASDEX (±5%), AUG (±10%), CMOD (±5%), COMPASS (±10%), D3D (Na), JET (±5%), JFT2M (±5%), JT60U (±20%), PBXM (±50%), PDX (±10%), TCV (±3%), TEXTOR (±5%), TFTR (±5%+0.05V), TDEV (±0.02V), START (±10%), T10 (±20%), TUMAN3M (±5%), MAST (Na).

63. Q95: The plasma safety factor from an MHD equilibrium fit evaluated at the flux surface that encloses 95% of the total poloidal flux.
ASDEX: Q95 = qcyl (1 + (AMIN/RGEO)^2 (1 + 0.5 BEILI2^2))
with qcyl = 5 ´ 10^6 (BT/IP) (AMIN^2/RGEO) (1 + KAPPA^2)/2.
TFTR: Q at boundary defined by limiter.
Normal level of accuracy is
ASDEX (±10%), AUG (±5%), CMOD (±3%), COMPASS (±10%), D3D (±3%), JET (±10%), JFT2M (±10%), JT60U (±5%), PBXM (±10%), PDX (±10%), TCV (±3%), TEXTOR (±10%), TFTR (±6%), TDEV (±10%), START (±10%), T10 (±10%), TUMAN3M (Na), **MAST (±???%)**.

64. SH95: The magnetic shear at the flux surface that encloses 95% of the total poloidal flux.
Normal level of accuracy is
ASDEX (Na), AUG (Na), CMOD (Na), COMPASS (Na), D3D (±50%), JET (±50%), JFT2M (Na), JT60U (Na), PBXM (Na), PDX (Na), TCV (Na), TEXTOR (Na), TFTR (Na), TDEV (Na), START (Na), T10 (Na), TUMAN3M (Na), MAST (Na).

65. BEILI2: This quantity is determined from MHD or probe measurements (ASDEX), and represents b_I + 0.5 l_i,
where b_I is the Shafranov beta and l_i the internal inductance.
Normal level of accuracy is
ASDEX (±10%), AUG (±3%), CMOD (±3%), COMPASS (Na), D3D (±3%), JET (±5%), JFT2M (±10%), JT60U (±5%), PBXM (±10%), PDX (±10%), TCV (±3%), TEXTOR (±20%), TFTR (±4%), TDEV (±5%), START (Na), T10 (±10%), TUMAN3M (Na), MAST (Na).

66. BEIMHD: Beta Shafranov from MHD.
ASDEX: BEIMHD equals BEILI2 minus an estimate of l_i/2 obtained during the Ohmic phase assuming a resistive equilibrium.
TFTR: BEIMHD equals (2´BEPMHD + BEPDIA)/3.
Normal level of accuracy is
ASDEX (±15%), AUG (Na), CMOD (Na), COMPASS (Na), D3D (±0.05/bp), JET (±12%), JFT2M (±15%), JT60U (Na), PBXM (±15%), PDX (±15%), TCV (±10%), TEXTOR (±15%), TFTR (±4%´BEILI2 + 0.1), **TDEV (±???%)**, START (Na), T10 (±10%), TUMAN3M (Na), MAST (Na).

67. BEPMHD: Poloidal beta computed from the MHD equilibrium fit.
ASDEX: BEPMHD equals BEIMHD.
TFTR: BEPMHD equals BEILI2 - l_i/2 with l_i/2 from time evolution model.

Normal level of accuracy is
ASDEX (±15%), AUG (±10%), CMOD (±0.05´bp), COMPASS (Na), D3D (±0.05´bp), JET (Na), JFT2M (±15%), JT60U (±7%), PBXM (±20%), PDX (±20%), TCV (±10%), TEXTOR (±15%), TFTR (±4%´BEILI2 + 0.1), TDEV (Na), START (Na), T10 (±10%), TUMAN3M (Na), MAST (Na).

68. BETMHD: Toroidal beta computed from the MHD equilibrium fit.
TFTR: Computed from BEPMHD.
Normal level of accuracy is
ASDEX (±18%), AUG (±15%), CMOD (±0.05/bp), COMPASS (Na), D3D (±0.05/bp), JET (±12%), JFT2M (±15%), JT60U (±7%), PBXM (±20%), PDX (±20%), TCV (±10%), TEXTOR (±15%), TFTR (±4% + fractional error BEIMHD), **TDEV (±???%)**, START (±15%), T10 (±10%), TUMAN3M (Na), MAST (Na).

69. BEPDIA: Poloidal diamagnetic beta.
ASDEX: Corrected poloidal diamagnetic beta using an average of the 3 Ohmic points in the database.
Normal level of accuracy is
ASDEX (±15%), AUG (±10%), CMOD (Na), COMPASS (±0.1), D3D (Na), JET (±20%), JFT2M (Na), JT60U (Na), PBXM (Na), PDX (Na), TCV (Na), TEXTOR (Na), TFTR (±4% + 100kJ/WDIA), TDEV (±25%), START (Na), T10 (±10%), TUMAN3M (Na), MAST (Na).

70. BMHDMDIA: Offset during the Ohmic phase between MHD and diamagnetic.
ASDEX: Between diamagnetic beta poloidal and MHD beta poloidal (± 5%).
JFT2M: Between diamagnetic energy and MHD energy in Joule (± 10-20%).
ASDEX (±5%), AUG (Na), CMOD (Na), COMPASS (Na), D3D (Na), JET (Na), JFT2M (±10-20%), JT60U (Na), PBXM (Na), PDX (Na), TCV (Na), TEXTOR (Na), TFTR (Na), TDEV (Na), START (Na), T10 (Na), TUMAN3M (Na), MAST (Na).

71. TAUCR: Current relaxation time in seconds from D.R. Mikkelsen Phys. Fluids B1 (1989) 333.
TAUCR = 2.51 ´ 10^{-6} ´ IP ´ RGEO / VSURF

72. FBS: Bootstrap current fraction.

73. RHOQ2: Normalized radius of q = 2 surface.

74. RHOINV: Normalized sawtooth inversion radius as estimated by eq.(7) in H. Weisen et al, Nuclear Fusion 42 (2002) 136.
RHOINV = 4 ´ 10^{-7} ´ IP ´ RGEO / ($AMIN^2$´ BT´ KAPPA ´ (KAPPA + 1/ KAPPA)

Densities

75. NEL: Central line average electron density in m^{-3} from interferometer or LIDAR (JET).
JET: NEL has been approximated if no measurement is available by
Ohmic: NEL ~ exp{2.931 + 0.873 ln(NEV) + 0.064 ln(NE0)}
H-mode: NEL ~ exp{3.745 + 0.825 ln(NEV) + 0.092 ln(NE0)}
The variable NELFORM indicates if NEL is measured or approximated.
Normal level of accuracy is

ASDEX (±3%), AUG (±3%), CMOD (±5%), COMPASS (±5%), D3D (±2´ 10^{18} m^{-3}), JET (±8%), JFT2M (±2%), JT60U (±10%), PBXM (±5%), PDX (±5%), TCV (±5%), TEXTOR (±2%), TFTR (±5%), TDEV (±2%), START (±5%), T10 (±3%), TUMAN3M (±10%), **MAST (±???%)**.

76. NELFORM: Indicates if NEL is not a direct measurement.
= **1** if NEL has been approximated by formula for JET,
= **0** otherwise.

77. DNELDT: The time rate of change of NEL in m^{-3}/s.
Normal level of accuracy is

ASDEX (±2%), AUG (±3%), CMOD (±5%), COMPASS (Na), D3D (±2´ 10^{18} m^{-3}/s), JET (±8%), JFT2M (±2%), JT60U (±10%), PBXM (±5%), PDX (±5%), TCV (±5%), TEXTOR (±5%), TFTR (±5%), TDEV (±10%), START (Na), T10 (Na), TUMAN3M (Na), MAST (Na).

78. NEV: The volume averaged electron density in m^{-3}.

ASDEX: Determined from 4 HCN interferometer channels fitting $n(x) = n(1) + (n(0) - n(1)) (1 - x^a)^b$, $0 <= x <= 1$. For all volume integrations (NEV, TEV, WEKIN), a circular plasma was assumed.
D3D: Determined by a spline density profile fit to the CO_2 and Thomson scattering density data.
JET: Determined from weighted summation over 6 interferometer channels.
JFT2M: Determined from an analytic fit with fixed profile shape to 2 interferometer channels.
Normal level of accuracy is
ASDEX (±5%), AUG (±10%), CMOD (±7%), COMPASS (Na), D3D (±10%), JET (±8%), JFT2M (±2%), JT60U (±10%), PBXM (±5%), PDX (±5%), TCV (±5%), TEXTOR (±10%), TFTR (±10%), TDEV (±10%), START (Na), T10 (±10%), TUMAN3M (Na), MAST (Na).

79. NE0: The central electron density at the magnetic axis in m^{-3} determined in same manner as NEV.
Normal level of accuracy is
ASDEX (±10%), AUG (±20%), CMOD (±10%), COMPASS (Na), D3D (±15%), JET (±10%), JFT2M (Na), JT60U (±20%), PBXM (Na), PDX (Na), TCV (±10%), TEXTOR (±10%), TFTR (±10%), TDEV (±10%), START (Na), T10 (±10%), TUMAN3M (Na), MAST (Na).

80. NE0TSC. The electron density in m^{-3} determined from Thomson scattering.
ASDEX: Average of the 3 YAG laser channels closest to the equatorial plane.
D3D: Thomson scattering point that is closest to the magnetic axis (less than 10 cm).
Normal level of accuracy is
ASDEX (±5%), AUG (±30%), CMOD (Na), COMPASS (Na), D3D (±10%), JET (Na), JFT2M (Na), JT60U (±10%), PBXM (Na), PDX (Na), TCV (±10%), TEXTOR (Na), TFTR (Na), TDEV (Na), START (Na), T10 (Na), TUMAN3M (Na), MAST (Na).

Impurities

81. ZEFF: Line average plasma effective charge determined from visible Bremsstrahlung.
Normal level of accuracy is
ASDEX (±10%), AUG (Na), CMOD (±20%), COMPASS (Na), D3D (±20%), JET (±30%), JFT2M (Na), JT60U (±15%), PBXM (Na), PDX (Na), TCV (±20%), TEXTOR (Na), TFTR (Na), TDEV (±25%), START (Na), T10 (±30%), TUMAN3M (Na), MAST (Na).

82. ZEFFNEO: Plasma effective charge as determined by neo-classical resistivity.
ASDEX: Determined such that the current profile calculated from $Z_{eff\text{-}neo}$, T_e (r) and U_{loop} is consistent with the measured total I_p.
JET: Determined using volume averaged quantities.
Normal level of accuracy is
ASDEX (±15%), AUG (Na), CMOD (Na), COMPASS (Na), D3D (Na), JET (±25%), JFT2M (Na), JT60U (Na), PBXM (Na), PDX (Na), TCV (Na), TEXTOR (Na), TFTR (Na), TDEV (Na), START (Na), T10 (Na), TUMAN3M (Na), MAST (Na).

83. PRAD: Total radiated power in watts as measured by Bolometer.
Normal level of accuracy is
ASDEX (±20%), AUG (±20%), CMOD (±20%), COMPASS (Na), D3D (±15%), JET (±10-15%), JFT2M (±10-20%), JT60U (±20%), PBXM (±25%), PDX (Na), TCV (Na), TEXTOR (±15%), TFTR (Na), TDEV (±20%), **START (±???%)**, T10 (±25%), TUMAN3M (Na), **MAST (±???%)**.

Input powers

84. POHM: Total Ohmic power in watts.
ASDEX: Determined from max{0, VSURF ´ IP}.
AUG: Calculated as VSURF ´ IP, where VSURF is corrected for flux variations between the loop and the plasma surface.
CMOD: Calculated as V_{res} ´ IP, where V_{res} is calculated from VSURF corrected for inductive effects.
COMPASS: Calculated as VSURF ´ IP.
D3D: Calculated using C´B_{10}´ Ip^2 $RGEO^2$ / (WT n_e), where B_{10} is the central visible Bremsstrahlung signal.
When n_e is determined from the radial (vertical) CO_2 chord, C is equal to 1.03´10^{-19}(9.92 ´10^{-20}).
JET: Corrected for inductance effects.
JFT2M: Calculated as VSURF ´ IP.
JT60U: Calculated as VSURF ´ IP for SHOT < 33635.
Calculated for SHOT >= 33635 on the basis of Te profile with the assumption of uniform ZEFF and toroidal electric field. Neo-classical resistivity was applied. This calculation is automatically performed by the transport analysis code (TOPICS) on the basis of diagnostic data.
PBXM: Calculated as VSURF ´ IP.
PDX: Calculated using VSURF and IP corrected for inductance effects.
TCV: Calculated as VSURF ´ IP. VSURF is obtained by the equilibrium LIUQE.
TEXTOR: Calculated as VSURF ´ IP.
TFTR: POHM = IP ´ VSURF – d(3.14 ´ 10^{-7} RGEO ´ IP^2 ´ l_i)/dt
TDEV: Calculated as??????
START: Calculated using VSURF and IP corrected for inductance effects.

T10: Calculated as VSURF ´ IP.
TUMAN3M: Calculated as VSURF ´ IP.
Normal level of accuracy is
ASDEX (Ohmic: ±5% H: ±50%), AUG (±15%), CMOD (±15%), COMPASS (±10%), D3D (±15%), JET (±20%), JFT2M (±10%), JT60U (±20%), PBXM (±50%), PDX (±20%), TCV (±10%), TEXTOR (±10%), TFTR (±300kW), TDEV (±5%), START (±10%), T10 (±20%), TUMAN3M (±6%), **MAST (±???%)**.

85. ENBI: Neutral beam energy weighted by power in volts. This quantity is calculated from S(E_i P_i / S(P_i)) where E_i and P_i are the beam energy and power for source i, respectively.
ASDEX: the primary energy component is given.
Normal level of accuracy is
ASDEX (±0.2KV), AUG (±5%), CMOD (Na), COMPASS (Na), D3D (±10%), JET (±12%), JFT2M (±5%), JT60U (±5%), PBXM (±15%), PDX (±15%), TCV (Na), TEXTOR (±5%), TFTR (±5%), TDEV (Na), START (Na), T10 (Na), TUMAN3M (Na), MAST (Na).

86. PINJ: The injected neutral beam power with beam of (BGASA, BGASZ) that passes into the torus in watts.
Zero if no beams are on. Notice total injected neutral beam power is PINJ + PINJ2.
Normal level of accuracy is
ASDEX (±5%), AUG (±5%), CMOD (Na), COMPASS (Na), D3D (±10%), JET (±6%), JFT2M (±5%), JT60U (±5%), PBXM (±5%), PDX (±10%), TCV (Na), TEXTOR (±5%), TFTR (±15% absolute, ±2% relative), TDEV (Na), START (±5%), T10 (Na), TUMAN3M (Na), **MAST (±???%)**.

87. BSOURCE: The power fractions injected by neutral beam.
For example if P1 = 80%, P2 = 10% and P3 = 10% then BSOURCE = 801010.

88. PINJ2: The injected neutral beam power from a second source with beam of (BGASA2, BGASZ2) in watts. Zero if no beams of second source are on.
Normal level of accuracy is
ASDEX (Na), AUG (±5%), CMOD (Na), COMPASS (Na), D3D (Na), JET (±6%), JFT2M (Na), JT60U (Na), PBXM (Na), PDX (Na), TCV (Na), TEXTOR (±5%), TFTR (±15% absolute, ±2% relative), TDEV (Na), START (Na), T10 (Na), TUMAN3M (Na), MAST (Na).

89. BSOURCE2: The power fractions injected by neutral beam with the second source.
JET: For 89-90 data the possibilities for BSOURCE and BSOURCE2 are
781606 for 80kV D, 652114 for 140kV D, 990000 for ^{3}He or ^{4}He beams.

90. COCTR: Fraction of beam power co-injected as compared to the total beam power injected.

91. PNBI: Total injected neutral beam power minus shine through in watts. Zero if no beams are on.
Normal level of accuracy is
ASDEX (±10%), AUG (±10%), CMOD (Na), COMPASS (Na), D3D (±10%), JET (±10%), JFT2M (±10%), JT60U (±10%), PBXM (±10%), PDX (±10%), TCV (Na), TEXTOR (±10%), TFTR (±15% absolute, ±5% relative), TDEV (Na), START (±20%), T10 (Na), TUMAN3M (Na), **MAST (±???%)**.

92. PFLOSS: Amount of neutral beam power in watts that is lost from the plasma through charge exchange
and unconfined orbits.
ASDEX: From fits to FREYA code results.
D3D: PNBI ´ exp{3.3 - 2.5 IP/10^6}/100.
JET: PINJ ´ exp{3.35 - 0.667|IP|/10^6 - 0.2 NEL/10^{19}}/100.
JFT2M: From fits to Monte Carlo code results.
PBXM: From a fits to the TRANSP code results.
PDX: From a fits to the TRANSP code results.
Normal level of accuracy is
ASDEX (±30%), AUG (±20%), CMOD (Na), COMPASS (Na), D3D (±30%), JET (±50%), JFT2M (±20%), JT60U (±20%), PBXM (±20%), PDX (±30%), TCV (Na), TEXTOR (±30%), TFTR (±20%), TDEV (Na), START (±20%), T10 (Na), TUMAN3M (Na), MAST (Na).

93. ECHFREQ: ECRH frequency in Hz. Zero if no ECRH is applied.
Normal level of accuracy is
ASDEX (Na), AUG (Na), CMOD (Na), COMPASS (±0.1%), D3D (±0.1%), JET (Na), JFT2M (Na), JT60U (Na), PBXM (Na), PDX (Na), TCV (Na), TEXTOR (Na), TFTR (Na), TDEV (±0.1%), START (Na), T10 (±0.1%), TUMAN3M (Na), MAST (Na).

94. ECHMODE: Mode of ECRH waves.
Possible values are:

NONE	If no ECRH power has been applied to discharge
OFF	If PECRH = 0 but PECRH > 0 at some other time in discharge
O	is ordinary mode
X	is extraordinary
X+O	both ordinary and extraordinary mode
UNKNOWN	Mode of ECRH unknown

95. ECHLOC: Location of ECRH launch.
Possible values are:

NONE	If no ECRH power has been applied to discharge
OFF	If PECRH = 0 but PECRH > 0 at some other time in discharge
IN	identifies waves launched from the high field side
OUT	is from the low field side
IN+OUT	from both low and high field side
LFS_UP LFS_UPPER	from low field side top

UNKNOWN	Location of ECRH launch unknown

96. PECRHC: ECRH power in watts coupled to the plasma. Zero, if no ECRH is applied.
Normal level of accuracy is
ASDEX (Na), AUG (Na), CMOD (Na), COMPASS (±5%), D3D (±10%), JET (Na), JFT2M (Na), JT60U (Na), PBXM (Na), PDX (Na), TCV (Na), TEXTOR (Na), TFTR (Na), TDEV (±10%), START (Na), T10 (±10%), TUMAN3M (Na), MAST (Na).

97. PECRH: ECRH power in watts absorbed by the plasma. Zero if no ECRH is applied.
Normal level of accuracy is
ASDEX (Na), AUG (Na), CMOD (Na), COMPASS (±15%), D3D (±10%), JET (Na), JFT2M (Na), JT60U (Na), PBXM (Na), PDX (Na), TCV (Na), TEXTOR (Na), TFTR (Na), TDEV (±10%), START (Na), T10 (±15%), TUMAN3M (Na), MAST (Na).

98. ICFREQ: Frequency of ICRH waves in Hz. Zero, if no ICRH is applied.
Normal level of accuracy is
ASDEX (Na), AUG (±1%), CMOD (±0.5%), COMPASS (Na), D3D (±0.001%), JET (±1%), JFT2M (Na), JT60U (Na), PBXM (Na), PDX (Na), TCV (Na), TEXTOR (±0.1%), TFTR (Na), TDEV (Na), START (Na), T10 (Na), TUMAN3M (Na), MAST (Na).

99. ICSCHEME: ICRH heating scheme.
Possible Values:

NONE	If no ICRH power has been applied to discharge
OFF	If PICRH = 0 but PICRH > 0 at some other time in discharge
HMIN	for H minority
HE3MIN	for ^{3}He minority
H2NDHARM	for 2nd harmonic H heating
HE3MIN-T	^{3}He minority in Tritium
HMIN-T	H minority in Tritium
HHFW	
UNKNOWN	Heating scheme not supplied

100. ICANTEN: Antenna phasing.
Possible Values are:

NONE	If no ICRH power has been applied to discharge

OFF	If PICRH = 0 but PICRH > 0 at some other time in discharge
DIPOLE	Dipole phasing
MONOPOLE	Monopole phasing
UNKNOWN	Antenna phasing not supplied

101. PICRHC: ICRH power in watts coupled to the plasma. Zero, if no ICRH is applied.
Normal level of accuracy is
ASDEX (Na), AUG (±10%), CMOD (±3-5%), COMPASS (Na), D3D (±5%), JET (±10%), JFT2M (Na), JT60U (Na), PBXM (Na), PDX (Na), TCV (Na), TEXTOR (±10%), TFTR (Na), TDEV (Na), START (Na), T10 (Na), TUMAN3M (Na), MAST (Na).

102. PICRH: ICRH power in watts absorbed by the plasma. Zero, if no ICRH is applied.
Normal level of accuracy is
ASDEX (Na), AUG (±10%), CMOD (±10%), COMPASS (Na), D3D (±10-20%), JET (±10%), JFT2M (Na), JT60U (Na), PBXM (Na), PDX (Na), TCV (Na), TEXTOR (±10%), TFTR (Na), TDEV (Na), START (Na), T10 (Na), TUMAN3M (Na), MAST (Na).

103. PALPHA: Estimated alpha heating power in Deuterium-Tritium plasmas in watts.
JET: estimated as 1.601 ´ 10^{-19} ´ neutrons/s ´ 3.5 ´ 10^{6} W. Set to zero, if less than 0.01 ´ 10^{6} W.
Normal level of accuracy is
ASDEX (Na), AUG (Na), CMOD (Na), COMPASS (Na), D3D (Na), JET (±10%), JFT2M (Na), JT60U (Na), PBXM (Na), PDX (Na), TCV (Na), TEXTOR (Na), TFTR (±20%), TDEV (Na), START (Na), T10 (Na), TUMAN3M (Na), MAST (Na).

104. DWDIA: Time rate of change of the total plasma stored energy as determined by the diamagnetic loop in watts.
ASDEX: Parabolic fit to time evolution of diamagnetic b_p over ± 6 ms, when DWHC = 0. Set by hand from drawing the tangent to the WDIA time trace, when DWHC = 1.
D3D: (± 25%)
JET: Running average method over ± 100 ms.
JFT2M: Simple derivative over ± 5ms.
Normal level of accuracy is
ASDEX (±20%), AUG (±30%), CMOD (Na), COMPASS (±30%), D3D (±25%), JET (±10%), JFT2M (±20%), JT60U (±20%), PBXM (Na), PDX (±10%), TCV (Na), TEXTOR (±20%), TFTR (±5% + fractional error WDIA), TDEV (±50%), START (Na), T10 (±15%), TUMAN3M (±20%), MAST (Na).

105. DWDIAPAR: Time derivative for ASDEX of WDIA from a parabolic fit to the three available H-mode points.
DWDIAPAR has been used in calculating TAUDIA.
Normal level of accuracy is
ASDEX (±20%), AUG (Na), CMOD (Na), COMPASS (Na), D3D (Na), JET (Na), JFT2M (Na), JT60U (Na), PBXM (Na), PDX (Na), TCV (Na), TEXTOR (Na), TFTR (Na), TDEV (Na), START (Na), T10 (Na), TUMAN3M (Na), MAST (Na).

106. DWMHD: Time rate of change of the total plasma stored energy as determined from MHD in watts.
ASDEX: As for DWDIA.
D3D: A spline fit is made to W and this fitted curve is then differentiated.
JET: As for DWDIA.
JFT2M: Simple derivative over ± 5ms of WMHD without correcting for the change of l_i from a current filament method.
Normal level of accuracy is
ASDEX (±20%), AUG (±30%), CMOD (±20%), COMPASS (Na), D3D (±25%), JET (±20%), JFT2M (±20%), JT60U (Na), PBXM (±10%), PDX (±10%), TCV (±10%), TEXTOR (±20%), TFTR (±5% + fractional error WTOT), TDEV (±25%), START (±20%), T10 (±15%), TUMAN3M (Na), **MAST (±???%)**.

107. DWHC: Equal to **1** when DWDIA or DWMHD have been corrected by hand for ASDEX.

Temperatures

108. TEV: The volume averaged electron temperature in eV.
ASDEX: From 16 radial YAG measurements fitting $T_e(x) = T_e(0) \exp(ax^2 + bx^4 + cx^6)$.
D3D: Determined by a spline temperature profile fit to the Thomson scattering data.
JET: From 51 point ECE temperature profile.
PBXM: Volume averaged electron temperature computed from BETMHD, VOL, NEL, assuming $Z_{eff} = 1$.
PDX: Volume averaged electron temperature computed from BETMHD, VOL, NEL, assuming $Z_{eff} = 1$.
Normal level of accuracy is
ASDEX (±5%), AUG (Na), CMOD (±5%), COMPASS (Na), D3D (±10%), JET (±10%), JFT2M (Na), JT60U (±5%), PBXM (±30%), PDX (±30%), TCV (±5%), TEXTOR (Na), TFTR (±15%), **TDEV (±???%)**, START (Na), T10 (±15%), TUMAN3M (Na), MAST (Na).

109. TE0: The electron temperature at the magnetic axis in eV.
ASDEX: From 16 radial YAG measurements under the same profile assumptions as for TEV.
D3D: Determined by a spline temperature profile fit to the Thomson scattering data.
JET: From ECE temperature profile.
Normal level of accuracy is
ASDEX (±10%), AUG (±30%), CMOD (±10%), COMPASS (Na), D3D (±10%), JET (±10%), JFT2M (Na), JT60U (±10%), PBXM (Na), PDX (Na), TCV (±10%), TEXTOR (±15%), TFTR (±10%), TDEV (±10%), START (Na), T10 (±15%), TUMAN3M (Na).

110. TE0TSC: The electron temperature in eV, determined from the Thomson scattering point that is closest to the magnetic axis.
ASDEX: Average of the 3 YAG laser channels closest to the equatorial plane.
D3D: Thomson scattering point that is closest to the magnetic axis (less than 10 cm).
Normal level of accuracy is
ASDEX (±5%), AUG (Na), CMOD (Na), COMPASS (Na), D3D (±10%), JET (Na), JFT2M (Na), JT60U (±10%), PBXM (Na), PDX (Na), TCV (Na), TEXTOR (Na), TFTR (Na), **TDEV (±???%)**, START (Na), T10 (Na), TUMAN3M (Na), MAST (Na).

111. TIV: The volume averaged ion temperature in eV.

D3D: Determined by a spline temperature profile fit to the charge exchange recombination data.
JET: Estimated from TIV = TI0 ´ TEV/TE0.
PBXM: TIV = TEV.
PDX: TIV = TEV.
Normal level of accuracy is
ASDEX (Na), AUG (Na), CMOD (Na), COMPASS (Na), D3D (±10%), JET (±30%), JFT2M (Na), JT60U (±7%), PBXM (±30%), PDX (±30%), TCV (Na), TEXTOR (Na), TFTR (±20%), **TDEV (±???%)**, START (Na), T10 (Na), TUMAN3M (Na), MAST (Na).

112. TI0: The ion temperature at the magnetic axis in eV.
D3D: Determined by a spline temperature profile fit to the charge exchange recombination data.
JET: From Crystal X-ray diagnostic.
Normal level of accuracy is
ASDEX (Na), AUG (±40%), CMOD (±15%), COMPASS (Na), D3D (±10%), JET (±10%), JFT2M (Na), JT60U (±10%), PBXM (Na), PDX (Na), TCV (Na), TEXTOR (Na), TFTR (±15%), **TDEV (±???%)**, START (Na), T10 (±10%), TUMAN3M (Na), MAST (Na).

113. TICX0: The ion temperature at the magnetic axis in eV.
JET: From charge exchange recombination spectroscopy.
Normal level of accuracy is
ASDEX (Na), AUG (Na), CMOD (Na), COMPASS (Na), D3D (Na), JET (±10%), JFT2M (Na), JT60U (±10%), PBXM (Na), PDX (Na), TCV (Na), TEXTOR (Na), TFTR (Na), TDEV (Na), START (Na), T10 (Na), TUMAN3M (Na), MAST (Na).

Energies

114. WDIA: Total plasma energy in joules as determined from the diamagnetic loop.
ASDEX: In ohmic WDIA = Wdia-meas (±20%) where Wdia-meas = 0.471 ´ RGEO ´ 10^{-6} ´ IP^2 ´ BEPDIA.
In H-mode phase WDIA = Wdia-meas - DW where DW = Wdia-meas(Ohmic) - WMHD (Ohmic).
JFT2M: In ohmic WDIA = Wdia-meas (± 1-2 kJ).
In H-mode phase WDIA = Wdia-meas - DW, where DW = Wdia-meas(Ohmic) - WMHD (Ohmic).
TFTR: WDIA = 4.71 ´ 10^{-7} RGEO ´ IP^2 ´ BEPDIA.
Normal level of accuracy is
ASDEX (±10%), AUG (±10%), CMOD (Na), COMPASS (±15%), D3D (±0.1/bp), JET (±5%), JFT2M (±15%), JT60U (±5%), PBXM (Na), PDX (±15%), TCV (Na), TEXTOR (±10%), TFTR (±4% + 100kJ), TDEV (±10%), START (Na), T10 (±10%), TUMAN3M (±20%), MAST (Na).

115. WMHD: Total plasma energy in joules as determined by a MHD equilibrium fit or based on probe measurements and an estimate of l_i/2 (ASDEX).
ASDEX: 0.471 ´ RGEO´ 10^{-6} ´ IP^2 ´ BEPMHD.
TFTR: WMHD = WTOT currently; it should be WMHD = (3 ´ WTOT - WDIA)/2.
Normal level of accuracy is
ASDEX (Ohmic: ± 20%, H: ±10%), AUG (±10%), CMOD (±10% +10KJ), COMPASS (Na), D3D (±0.05/bp), JET (±15%), JFT2M (±15%), JT60U (±5%), PBXM (±15%), PDX (±15%), TCV (±10%), TEXTOR (±20%), TFTR (±2% + fractional error BEIMHD), TDEV (±10%), START (±15%), T10 (±10%), TUMAN3M (Na), **MAST (±???%)**.

116. WKIN: Total thermal plasma energy in joules as determined from kinetic measurements.
ASDEX: WEKIN (1 + (7-ZEFF)/(7-1)). ZEFFNEO is used instead of ZEFF for Ohmic points.
JET: From a profile fit assuming flat Z_{eff} profile and T_i profile as T_e.
TEXTOR: WDIA - 1.5 WFPER.
Normal level of accuracy is
ASDEX (±250%), AUG (Na), CMOD (±20%), COMPASS (Na), D3D (±0.05/bp), JET (±25%), JFT2M (Na), JT60U (±15%), PBXM (Na), PDX (±15%), TCV (Na), TEXTOR (±15%), TFTR (±25%), **TDEV (±???%)**, START (Na), T10 (Na), TUMAN3M (Na), MAST (Na).

117. WEKIN: Total thermal electron plasma energy in joules as determined from kinetic measurements.
Normal level of accuracy is
ASDEX (±10%, H: ±15%), AUG (Na), CMOD (±15%), COMPASS (Na), D3D (±15%), JET (±20%), JFT2M (Na), JT60U (±15%), PBXM (Na), PDX (Na), TCV (±10%), TEXTOR (Na), TFTR (±20%), **TDEV (±???%)**, START (Na), T10 (±20%), TUMAN3M (Na), MAST (Na).

118. WIKIN: Total thermal ion plasma energy in joules as determined from kinetic measurements.
JET: From ECE temperature profile shape normalized to T_i (o) from crystal X-ray diagnostic.
Normal level of accuracy is
ASDEX (Na), AUG (Na), CMOD (±25%), COMPASS (Na), D3D (±15%), JET (±15%), JFT2M (Na), JT60U (±15%), PBXM (Na), PDX (Na), TCV (Na), TEXTOR (Na), TFTR (±25%), **TDEV (±???%)**, START (Na), T10 (Na), TUMAN3M (Na), MAST (Na).

119. WROT: Rotational energy in joules. Wrot is simply defined as 1/2 M V^2 where M is the mass of the thermal ions, and V is the thermal ion toroidal velocity. V is not directly measured, since we measure the toroidal rotation of Carbon. We use NCLASS to deduce the thermal ion velocity (the main correction for NSTX is at the edge).

120. WFPER: Total perpendicular fast ion energy due to NBI in joules as determined from transport calculations. Zero, if no NBI is applied.
JET: Calculated from the PENCIL code.
JFT2M: From Monte Carlo code.
PBXM: From TRANSP runs.
PDX: From TRANSP runs.
TEXTOR: From TRANSP runs.
Normal level of accuracy is
ASDEX (Na), AUG (±30%), CMOD (Na), COMPASS (Na), D3D (Na), JET (±30%), JFT2M (±20%), JT60U (Na), PBXM (±30%), PDX (±30%), TCV (Na), TEXTOR (±25%), TFTR (±30%), TDEV (Na), START (Na), T10 (Na), TUMAN3M (Na), MAST (Na).

121. WFPAR: Total parallel fast ion energy due to NBI in joules as determined from transport calculations.
JET: Calculated from the PENCIL code. Zero, if no NBI is applied.
JFT2M: From Monte Carlo code.
PBXM: From TRANSP runs.
PDX: From TRANSP runs.

TEXTOR: From TRANSP runs.
Normal level of accuracy is
ASDEX (Na), AUG (±30%), CMOD (Na), COMPASS (Na), D3D (Na), JET (±30%), JFT2M (±20%), JT60U (Na), PBXM (±30%), PDX (±30%), TCV (Na), TEXTOR (±25%), TFTR (±30%), TDEV (Na), START (Na), T10 (Na), TUMAN3M (Na), MAST (Na).

122. WFFORM: Total fast ion energy due to NBI in joules estimated from approximate formula. Zero, if no NBI is applied.
ASDEX: From regression analysis based on 176 FREYA runs:
$C \times FT \times NEL^{-1.3} \times PINJ \times ENBI^{0.75} \times (WTOT - WFFORM)^{0.5}$ for H beam, and
$C' \times F'T \times NEL^{-1.1} \times PINJ \times ENBI \times (WTOT - WFFORM)^{0.8}$ for D beam,
where C and C' are estimated constants depending on the target gas, and FT and F'T are estimated temperature effects. Missing temperature profiles are interpolated by regression of the available YAG temperature profiles in the database against IP, BT, NEL, NEV, EVAP and beam gas.
D3D: $\{0.55 \times P_b \tau_{se}/2\} \{1+(2/3)(v_c/v_b)^2 [(1/2) \ln(f(v_b,v_c))-3^{0.5} \times \{\pi/6+\tan^{-1}(g(v_b,v_c))\}]\}$
where $f(v_b,v_c)=(v_b+v_c)^2 / (v_b^2 - v_b v_c + v_c^2)$ and $g(v_b,v_c)=(2 v_b - v_c) / (3^{0.5} \times v_c)$
The velocities v_c and v_b are determined from the critical energy and the beam energy respectively, and P_b is the injected neutral beam power. The quantity τ_{se} is the slowing down-time on electrons first defined by Spitzer, $\tau_{se} = 6.3 \times 10^8 A_b T_e^{1.5} / (Z_b^2 n_e \ln(\Lambda_e))$, where A_b and Z_b are the atomic mass and charge of the fast ions, T_e is the electron temperature in eV, n_e is the electron density in cm^{-3}, and $\ln(\Lambda_e) \sim 16$ is the Coulomb logarithm. If ion drag were negligible, the term in the brackets would be identically one. For DIII-D parameters, however, this term varies rapidly with temperature. To give better agreement with ONETWO results, the above formula is multiplied by 0.55.
JET: $0.16 \times 10^{19} \times$ PINJ/NEV for SHOT <= 18760;
$10^{19} \times (0.16 P_{80kV} + 0.3 P_{140kV} + 0.02 P_{He})$/NEV for SHOT > 18760.
JFT2M: WFPER + WFPAR.
PBXM: WFPER + WFPAR.
PDX: WFPER + WFPAR.
Normal level of accuracy is
ASDEX (±15%), AUG (±30%), CMOD (Na), COMPASS (Na), D3D (±50%), JET (±50%), JFT2M (Co), JT60U (±20%), PBXM (Co), PDX (Co), TCV (Na), TEXTOR (±30%), TFTR (Na), TDEV (Na), START (±20%), T10 (Na), TUMAN3M (Na), MAST (Na).

123. WFANI: Estimate of fraction of perpendicular fast ion energy as compared to the total fast ion energy due to NBI. If WFPER and WFPAR are available, WFANI = WFPER/(WFPER + WFPAR).
Zero, if no NBI is applied.
ASDEX: From regression analysis based on 176 FREYA runs:
$C \times NEL^{0.04} (NE0 (ZEFF - 1))^{0.045}/ENBI^{0.14}$ for H beam and
$C' \times NEL^{0.12} (NE0(ZEFF - 1))^{0.020}/ENBI^{0.14}$ for D beam
where C and C' are estimated constants depending on the target gas. Missing central densities are interpolated by regression of the available central densities in the database against IP, BT, NEL, NEV, EVAP and PINJ. If not measured, ZEFF is assumed to be 3 for EVAP = NONE, 2.5 for carbonized shots and 1.5 for boronised shots.
D3D: The fast ion anisotropy is calculated only from geometry; the angles of the beam center line are known
relative to the geometric axis of the tokamak and from this the perpendicular and parallel components can be determined.

JET: 1.16×10^{-2} $NEL^{0.11}/ENBI^{0.07}$.
Normal level of accuracy is
ASDEX (±7%), AUG (±40%), CMOD (Na), COMPASS (Na), D3D (±50%), JET (±50%), JFT2M (Co), JT60U (Na), PBXM (Co), PDX (Co), TCV (Na), TEXTOR (±30%), TFTR (±20%), TDEV (Na), START (Na), T10 (Na), TUMAN3M (Na), MAST (Na).

124. WFICRH: Estimate of the perpendicular fast ion energy content during ICRH heating in Joules.
It is given by 4/3 (DWDIA - DWMHD), where DWDIA and DWMHD is the increase in energy due to ICRH.
Zero, if no ICRH is applied.
JET: Estimated with the PION code.
Normal level of accuracy is
ASDEX (Na), AUG (Na), CMOD (±50%), COMPASS (Na), D3D (Na), JET (±50%), JFT2M (Na), JT60U (Na), PBXM (Na), PDX (Na), TCV (Na), TEXTOR (Na), TFTR (Na), TDEV (Na), START (Na), T10 (Na), TUMAN3M (Na), MAST (Na).

125. WFICRHP: Estimate of the parallel fast ion energy content due to ICRH heating in Joules.
Zero, if no ICRH is applied.
JET: Estimated with the PION code.
Normal level of accuracy is
ASDEX (Na), AUG (Na), CMOD (Na), COMPASS (Na), D3D (Na), JET (±50%), JFT2M (Na), JT60U (Na), PBXM (Na), PDX (Na), TCV (Na), TEXTOR (Na), TFTR (Na), TDEV (Na), START (Na), T10 (Na), TUMAN3M (Na), MAST (Na).

126. WFICFORM: Total fast ion energy due to ICRH in joules estimated from approximate formula.
Zero, if no ICRH is applied.
JET: $= 0.3 \times (TE0/10^3)^{1.5} \times PICRH \times (10^{19}/NE0) / 17$ J.
Normal level of accuracy is
ASDEX (Na), AUG (Na), CMOD (Na), COMPASS (Na), D3D (Na), JET (±50%), JFT2M (Na), JT60U (Na), PBXM (Na), PDX (Na), TCV (Na), TEXTOR (Na), TFTR (Na), TDEV (Na), START (Na), T10 (Na), TUMAN3M (Na).

127. ICFORM: Indicates, if WFICFORM has been used in confinement calculations (=**1**).

128. WFANIIC: Estimate of fraction of perpendicular fast ion energy compared to the total fast ion energy due to ICRH heating.
Zero, if no ICRH is applied.
Normal level of accuracy is
ASDEX (Na), AUG (Na), CMOD (Na), COMPASS (Na), D3D (Na), JET (±50%), JFT2M (Na), JT60U (Na), PBXM (Na), PDX (Na), TCV (Na), TEXTOR (Na), TFTR (Na), TDEV (Na), START (Na), T10 (Na), TUMAN3M (Na), MAST (Na).

Energy confinement times

129. TAUDIA: Total diamagnetic energy confinement time in seconds.
Defined as WDIA/(POHM + PNBI + PICRH + PECRH - DWDIA).

Normal level of accuracy is
ASDEX (Ohmic: ±25% H: ±15%), AUG (±15%), CMOD (Na), COMPASS (±15%), D3D (±15%), JET (Ohmic: ±25% H: ±15%), JFT2M (±20%), JT60U (±15%), PBXM (Na), PDX (±20%), TCV (Na), TEXTOR (±15%), TFTR (±20% for DWDIA = 0), **TDEV (±30%)**, START (Na), T10 (±25%), TUMAN3M (±21%), MAST (Na).

130. TAUMHD: Total MHD energy confinement time in seconds.
Defined as WMHD/(POHM + PNBI + PICRH + PECRH - DWMHD).
Normal level of accuracy is
ASDEX (±15%), AUG (±15%), CMOD (±15%), COMPASS (Na), D3D (±15%), JET (±35%), JFT2M (±20%), JT60U (Na), PBXM (±20%), PDX (±20%), TCV (±10%), TEXTOR (±20%), TFTR (±20% for DWMHD = 0), TDEV (±30%), START (±15%), T10 (±25%), TUMAN3M (Na), **MAST (±???%)**.

131. TAUTH1: Thermal energy confinement time in seconds.
Defined as WKIN/(POHM + PNBI+ PICRH + PECRH - DWMHD - PFLOSS).
ASDEX: DWTOT = 2/3 DWMHD + 1/3 DWDIA was used instead of DWMHD.
Normal level of accuracy is
ASDEX (Co), AUG (Na), CMOD (Co), COMPASS (Na), D3D (Co), JET (Co), JFT2M (Na), JT60U (Co), PBXM (Co), PDX (Co), TCV (Na), TEXTOR (Co), TFTR (Co), TDEV (Co), START (Na), T10 (Na), TUMAN3M (Na), MAST (Na).

132. TAUTH2: Thermal energy confinement time in seconds.
Defined as WMHD-WFFORM - 0.75 WFICRH)/(POHM + PNBI + PICRH + PECRH - DWMHD - PFLOSS).
ASDEX: 1.5 WFANI ´ WFFORM and DWTOT (see TAUTH1) were used for WFFORM and DWMHD, respectively.
PBXM, PDX: 3/4´WFPER + 3/2´ WFPAR was used instead of WFFORM.
Normal level of accuracy is
ASDEX (Co), AUG (Co), CMOD (Co), COMPASS (Na), D3D (Co), JET (Co), JFT2M (Co), JT60U (Na), PBXM (Co), PDX (Co), TCV (Na), TEXTOR (Co), TFTR (Co), TDEV (Na), START (Na), T10 (Na), TUMAN3M (Na), MAST (Na).

Recommended values

133. WTOT: Estimated total plasma energy content in Joules.
Defined as
ASDEX: WTOT = WTH + WFFORM.
AUG: WTOT = WMHD.
CMOD: WTOT = WMHD.
COMPASS: WTOT = WDIA.
D3D: WTOT = WMHD.
JET: WTOT = WTH + WFPER + WFPAR + WFICRH. If WFPER and WFPAR are missing they are replaced by WFFORM.
JFT2M: WTOT = WTH + WFFORM.
JT60U: WTOT = WDIA
MAST: WTOT = WMHD
NSTX: WTOT = WTH
PBXM: WTOT = WTH + WFPER + WFPAR.

PDX: WTOT = WTH + WFPER + WFPAR.
START: WTOT = WMHD.
TCV: WTOT = WMHD.
TDEV: WTOT=WKIN
TEXTOR: WTOT = WTH + WFPER + WFPAR.
TFTR: WTOT = 3.14 ´ 10^{-7} RGEO´IP^2´(BEPMHD + BEPDIA/2)
TUMAN3M: WTOT = WDIA.
T10: WTOT = WDIA.

Normal level of accuracy is
ASDEX (Co), AUG (Co), CMOD (Co), COMPASS (Co), D3D (Co), JET (Co), JFT2M (Co), JT60U (Co), PBXM (Co), PDX (Co), TCV (Co), TEXTOR (Co), TFTR (±6% + 100kJ), TDEV (Co), START (Co), T10 (Co), TUMAN3M (Co), MAST (Co), NSTX (Co).

134. WTH: Estimated thermal plasma energy content in Joules.
Defined as
ASDEX: WTH = WDIA - 1.5 WFANI ´ WFFORM.
AUG: WTH = WMHD - 0.75 WFPER - 1.5 WFPAR.
CMOD: WTH = WTOT - WFICRH
COMPASS: WTH = WDIA.
D3D: WTH = WMHD - WFFORM.
JET: WTH = WDIA - 1.5 (WFPER + WFICRH). If WFPER is missing WFPER is replaced by WFANI ´ WFFORM.
JFT2M: WTH = WDIA/3 + 2 WMHD/3 - WFFORM.
JT60U: WTH = WKIN.
MAST: WTH = WMHD - WFFORM
NSTX: WTH = WKIN
PBXM: WTH = WMHD - 0.75 WFPER - 1.5 WFPAR.
PDX: WTH = WMHD - 0.75 WFPER - 1.5 WFPAR.
START: WTH = WMHD - WFFORM.
TCV: WTH = WMHD.
TDEV: WTH=WKIN.
TEXTOR: WTH = WDIA - 1.5 WFPER.
TFTR: WTH = WDIA - 1.5 WFPER.
TUMAN3M: WTH = WDIA.
T10: WTH = WDIA.

Normal level of accuracy is
ASDEX (Co), AUG (Co), CMOD (Co), COMPASS (Co), D3D (Co), JET (Co), JFT2M (Co), JT60U (Co), PBXM (Co), PDX (Co), TCV (Co), TEXTOR (Co), TFTR (Co), TDEV (Co), START (Co), T10 (Co), TUMAN3M (Co), MAST (Co), NSTX (Co).

135. PL: Estimated Loss Power not corrected for charge exchange and unconfined orbit losses in watts.
Defined as
ASDEX: PL = POHM + PNBI - DWDIA/3 - 2 DWMHD/3.
AUG: PL = POHM + PNBI + PICRH + PECRH - DWMHD.
CMOD: PL = POHM + PICRH - DWMHD.
COMPASS: PL = POHM + PECRH - DWDIA.
D3D: PL = POHM + PNBI + PECRH - DWMHD.
JET: PL = POHM + PNBI + PICRH - DWDIA.
JFT2M: PL = POHM + PNBI - DWDIA.
JT60U: PL= POHM + PNBI - DWDIA

MAST: PL = POHM + PNBI - DWMHD
NSTX: PL = POHM + PNBI + PICRH - DWMHD
PBXM: PL = POHM + PNBI - DWMHD.
PDX: PL = POHM + PNBI - DWMHD.
START: PL = POHM + PNBI - DWMHD.
TCV: PL = POHM - DWMHD.
TDEV: PL = POHM+PECRH-DWDIA
TEXTOR: PL = POHM + PNBI + PICRH - DWDIA.
TFTR: PL = POHM + PNBI - DWDIA
TUMAN3M: PL = POHM - DWDIA.
T10: PL = POHM + PECRH - DWDIA.

Normal level of accuracy is
ASDEX (Co), AUG (Co), CMOD (Co), COMPASS (Co), D3D (Co), JET (Co), JFT2M (Co), JT60U (Co), PBXM (Co), PDX (Co), TCV (Co), TEXTOR (Co), TFTR (Co), TDEV (Co), START (Co), T10 (Co), TUMAN3M (Co), MAST (Co), NSTX (Co).

136. PLTH: Estimated Loss Power corrected for charge exchange and unconfined orbit losses in Watts.
Defined as PLTH = PL - PFLOSS.
Normal level of accuracy is
ASDEX (Co), AUG (Co), CMOD (Co), COMPASS (Co), D3D (Co), JET (Co), JFT2M (Co), JT60U (Co), PBXM (Co), PDX (Co), TCV (Co), TEXTOR (Co), TFTR (Co), TDEV (Co), START (Co), T10 (Co), TUMAN3M (Co), MAST (Co), NSTX (Co).

137. TAUTOT: Estimated total energy confinement time in seconds.
Defined as WTOT/PL.
Normal level of accuracy is
ASDEX (Co), AUG (Co), CMOD (Co), COMPASS (Co), D3D (Co), JET (Co), JFT2M (Co), JT60U (Co), PBXM (Co), PDX (Co), TCV (Co), TEXTOR (Co), TFTR (Co), TDEV (Co), START (Co), T10 (Co), TUMAN3M (Co), MAST (Co), NSTX (Co).

138. TAUTH: Estimated thermal energy confinement time in seconds.
Defined as WTH/PLTH.
Normal level of accuracy is
ASDEX (Co), AUG (Co), CMOD (Co), COMPASS (Co), D3D (Co), JET (Co), JFT2M (Co), JT60U (Co), PBXM (Co), PDX (Co), TCV (Co), TEXTOR (Co), TFTR (Co), TDEV (Co), START (Co), T10 (Co), TUMAN3M (Co), MAST (Co), NSTX (Co).

139. TAUC92: Correction factor for thermal confinement time TAUTH
as described in **KARDAUN, O.J.W.F., et. al., Plasma Phys. Control. Nucl. Fus. Res. 3 (1993) 251.**
ASDEX: TAUC92 = 1/(1.5 - 0.1 bo - 0.15 ca), for ELMy or TAUC92 = 1/(1.2 - 0.1 bo - 0.15 ca), for ELM free
with bo = 1, if EVAP = BOROA or BOROB and ca = 1, if EVAP = CARBH otherwise bo = 0 and ca = 0.
JET: TAUC92 = 1/0.85, if 870101 < = DATE < = 871231.
PDX: TAUC92 = 1/((1/3) (DALFDV/DALFMP))$^{0.4}$, for ELMy.
In all other conditions TAUC92 = 1.
Normal level of accuracy is
ASDEX (±10%), AUG (Na), CMOD (Na), COMPASS (Na), D3D (Na), JET (±30%), JFT2M (Na), JT60U (Na), PBXM (Na), PDX (±10%), TCV (Na), TEXTOR (Na), TFTR (Na), TDEV (Na), START

(Na), T10 (Na), TUMAN3M (Na), MAST (Na).

140. TAUC93: Correction factor for thermal confinement time TAUTH
as described in **SCHISSEL, D. P., et al., EPS, Vol. 17C Part I (1993) 103.**
ASDEX: TAUC93 = 1/(1.5 - 0.1 bo - 0.15 ca), for ELMy or TAUC93 = 1/(1.2 - 0.1 bo - 0.15 ca), for ELM free
with bo = 1, if EVAP = BOROA or BOROB and ca = 1, if EVAP = CARBH otherwise bo = 0 and ca = 0.
PDX: TAUC93 = 1/((1/2) (DALFDV/DALFMP))$^{0.4}$, for ELMy.
In all other conditions TAUC93 = 1.
Normal level of accuracy is
ASDEX (±10%), AUG (Na), CMOD (Na), COMPASS (Na), D3D (Na), JET (Na), JFT2M (Na), JT60U (Na), PBXM (Na), PDX (±10%), TCV (Na), TEXTOR (Na), TFTR (Na), TDEV (Na), START (Na), T10 (Na), TUMAN3M (Na), MAST (Na).

141. H89: Enhancement factor TAUTOT ´ TAUC92 / ITER89-P
Scaling reference **YUSHMANOV, P. N., et. al., Nuclear Fusion 30 (1990).**
Normal level of accuracy is
ASDEX (Co), AUG (Co), CMOD (Co), COMPASS (Co), D3D (Co), JET (Co), JFT2M (Co), JT60U (Co), PBXM (Co), PDX (Co), TCV (Co), TEXTOR (Co), TFTR (Co), TDEV (Co), START (Co), T10 (Co), TUMAN3M (Co), MAST (Co).

142. HITERL96: Enhancement factor TAUTH ´ TAUC92 / ITERL96-P
Scaling reference **KAYE, S. M., et. al., Nuclear Fusion 37 (1997) 1303.**
Normal level of accuracy is
ASDEX (Co), AUG (Co), CMOD (Co), COMPASS (Co), D3D (Co), JET (Co), JFT2M (Co), JT60U (Co), PBXM (Co), PDX (Co), TCV (Co), TEXTOR (Co), TFTR (Co), TDEV (Co), START (Co), T10 (Co), TUMAN3M (Co), MAST (Na).

143. H93: Enhancement factor TAUTH ´ TAUC92 / ITERH93-P
Scaling reference **SCHISSEL, D. P., et al., EPS, Vol. 17C Part I (1993) 103.**
Normal level of accuracy is
ASDEX (Co), AUG (Co), CMOD (Co), COMPASS (Co), D3D (Co), JET (Co), JFT2M (Co), JT60U (Co), PBXM (Co), PDX (Co), TCV (Co), TEXTOR (Co), TFTR (Co), TDEV (Co), START (Co), T10 (Co), TUMAN3M (Co), MAST (Na).

144. HITER92Y: Enhancement factor TAUTH ´ TAUC92 / ITERH92Y
Scaling reference **KARDAUN, O. J. W. F., et. al., Plasma Phys. Control. Nucl. Fus. Res. 3 (1993) 251.**
Normal level of accuracy is
ASDEX (Co), AUG (Co), CMOD (Co), COMPASS (Co), D3D (Co), JET (Co), JFT2M (Co), JT60U (Co), PBXM (Co), PDX (Co), TCV (Co), TEXTOR (Co), TFTR (Co), TDEV (Co), START (Co), T10 (Co), TUMAN3M (Co), MAST (Na).

145. HEPS97: Enhancement factor TAUTH ´ TAUC93 / EPS97(ELMy)
Scaling reference **CORDEY, J.G., et. al., Plasma Physics and Controlled Fusion 39 (1997) B115.**
Normal level of accuracy is
ASDEX (Co), AUG (Co), CMOD (Co), COMPASS (Co), D3D (Co), JET (Co), JFT2M (Co), JT60U

(Co), PBXM (Co), PDX (Co), TCV (Co), TEXTOR (Co), TFTR (Co), TDEV (Co), START (Co), T10 (Co), TUMAN3M (Co), MAST (Na).

146. HIPB98y: Enhancement factor TAUTH ´ TAUC92 / IPB98(y)
Scaling reference **ITER PHYSICS BASIS Ch. 2, Nuclear Fusion 39 (1999) 2175**.
Normal level of accuracy is
ASDEX (Co), AUG (Co), CMOD (Co), COMPASS (Co), D3D (Co), JET (Co), JFT2M (Co), JT60U (Co), PBXM (Co), PDX (Co), TCV (Co), TEXTOR (Co), TFTR (Co), TDEV (Co), START (Co), T10 (Co), TUMAN3M (Co), MAST (Na).

147. HIPB98y1: Enhancement factor TAUTH ´ TAUC92 / IPB98(y,1)
Scaling reference **ITER PHYSICS BASIS Ch. 2, Nuclear Fusion 39 (1999) 2175**.
Normal level of accuracy is
ASDEX (Co), AUG (Co), CMOD (Co), COMPASS (Co), D3D (Co), JET (Co), JFT2M (Co), JT60U (Co), PBXM (Co), PDX (Co), TCV (Co), TEXTOR (Co), TFTR (Co), TDEV (Co), START (Co), T10 (Co), TUMAN3M (Co), MAST (Na).

148. HIPB98y2: Enhancement factor TAUTH ´ TAUC92 / IPB98(y,2)
Scaling reference **ITER PHYSICS BASIS Ch. 2, Nuclear Fusion 39 (1999) 2175**.
Normal level of accuracy is
ASDEX (Co), AUG (Co), CMOD (Co), COMPASS (Co), D3D (Co), JET (Co), JFT2M (Co), JT60U (Co), PBXM (Co), PDX (Co), TCV (Co), TEXTOR (Co), TFTR (Co), TDEV (Co), START (Co), T10 (Co), TUMAN3M (Co), MAST (Na).

149. HIPB98y3: Enhancement factor TAUTH ´ TAUC92 / IPB98(y,3)
Scaling reference **ITER PHYSICS BASIS Ch. 2, Nuclear Fusion 39 (1999) 2175**.
Normal level of accuracy is
ASDEX (Co), AUG (Co), CMOD (Co), COMPASS (Co), D3D (Co), JET (Co), JFT2M (Co), JT60U (Co), PBXM (Co), PDX (Co), TCV (Co), TEXTOR (Co), TFTR (Co), TDEV (Co), START (Co), T10 (Co), TUMAN3M (Co), MAST (Na).

150. HIPB98y4: Enhancement factor TAUTH ´ TAUC92 / IPB98(y,4)
Scaling reference **ITER PHYSICS BASIS Ch. 2, Nuclear Fusion 39 (1999) 2175**.
Normal level of accuracy is
ASDEX (Co), AUG (Co), CMOD (Co), COMPASS (Co), D3D (Co), JET (Co), JFT2M (Co), JT60U (Co), PBXM (Co), PDX (Co), TCV (Co), TEXTOR (Co), TFTR (Co), TDEV (Co), START (Co), T10 (Co), TUMAN3M (Co), MAST (Na).

Rotation information

151. OMGAIMP0: Rotation frequency of impurities in center of plasma in 1/seconds.
Rotation variables to be cast in terms of rotation frequency W, where $W=2pV_{tor}/L$, where $L=2pR_{local}$, so that $W=V_{tor}/R_{local}$. R_{local} is R at the point of measurement.

152. OMGAIMPH: Rotation frequency of impurities at the half radius in 1/seconds.
Rotation variables to be cast in terms of rotation frequency W, where $W=2pV_{tor}/L$, where $L=2pR_{local}$, so that $W=V_{tor}/R_{local}$. R_{local} is R at the point of measurement.

153. OMGAM0: Rotation frequency of the main plasma species in the center to in 1/seconds.
Rotation variables to be cast in terms of rotation frequency W, where $W=2pV_{tor}/L$, where $L=2pR_{local}$, so that $W=V_{tor}/R_{local}$. R_{local} is R at the point of measurement.

154. OMGAMH: Rotation frequency of main plasma species at the half radius in 1/seconds.
Rotation variables to be cast in terms of rotation frequency W, where $W=2pV_{tor}/L$, where $L=2pR_{local}$, so that $W=V_{tor}/R_{local}$. R_{local} is R at the point of measurement.

155. SPIN: Net fraction of NBI power in the parallel direction. Positive for co and negative for counter directions.
The formula is

$$SPIN \equiv \left(\frac{1}{P_{inj}}\right)\left[\sum_i^{co} P_i \cos\theta_i - \sum_i^{ctr} P_i \cos\theta_i\right]$$

where Pi is the power into the torus from each co and counter neutral beam source and qi is the angle between the source centerline and the geometric axis of the machine.

156. TORQ: The torque on the plasma due to neutral beam injection in Newton-meters.
The formula is

$$TORQ \equiv C\left[\sum_j^{co}\sum_i \left(\frac{m_j}{E_{ji}}\right)^{0.5} P_{ji}R_j - \sum_j^{ctr}\sum_i \left(\frac{m_j}{E_{ji}}\right)^{0.5} P_{ji}R_j\right]$$

where the sum over j is over each co and counter neutral beam source and the sum over i is over each energy component of the beam, full, half and one third. Eji is the energy of the ith energy component of the jth NB source, mj is the beam particle mass of the jth NB source, Pji is the power in the ith energy component of the jth NB source, and Rj is the radius of tangency of the jth NB source. The values of TORQ (newton.m) are obtained for the constant C=4.57 and mj (amu), Eji (keV), Pji (MW) and Rj (m).

157. TORQBM: Volume-integrated torque due to beam (as calculated in TRANSP, for instance) in Newton-meters.

= **TORQ** if no (e.g.) TRANSP calculation exists.

158. TORQIN: Volume-integrated total input torque (this could be a combination of beam torque + torque due to applied or intrinsic error fields) in Newton-meters.

= **TORQBM** if no additional torques are to be considered..

159. VTOR0: Definition to come.

160. VTORV: Definition to come.

161. VTORIMP: Definition to come. Set to **NONE.**

Standard dataset flags

162. STANDARD: Standard dataset flag.
Notice, can only be different from zero for observations that were in DB.1.
Possible values are:

1	For observations that belonged to the standard dataset of ITERH.DB1
0	All other observations

163. SELDB1: Flagging variable making connections to DB.1.
Notice, can only be different from zero for observations that were in DB.2.
SELDB1=S a(I.n) ´ 10$^{(n-1)}$, n=1-3.
a (I.1) = 1 If the observation was also in DB.1.
a (I.2) = 1 If the observation was in DB.1 and also satisfied the old DB.1 standard selection criteria.
a (I.3) = 1 If the observation satisfies the DB.1 standard selection criteria now (PHASE = H1 has been included).

164. SELDB2: Flagging variable for standard selection in DB.2
Notice, can only be different from zero for observations that were in DB.2.
(PABST = POHM + PNBI + PECRH + PICRH).
SELDB2=S a(II.n) ´ 10$^{(n-1)}$, n=1-10.

II.1 H-mode criterion.
a (II.1) = 0
if PHASE = H, HSELM, HGELM or HGELMH or H1 then a(II.1) = 1

II.2 NBI only with H° or D° injection.
a (II.2) = 0
if AUXHEAT = NB then
a (II.2) = 1
IF PINJ > 0 and (BGASA ^{1} 1 or 2) then a(II.2) = 0
IF PINJ2 > 0 and (BGASA2 ^{1} 1 or 2) then a(II.2) = 0

II.3 Missing confinement data
a (II.3) = 1
*** TAUMHD check ***
if TOK = AUG, CMOD, D3D, PBXM or PDX then

if TAUMHD missing then a (II.3) = 0
*** TAUDIA check ***
if TOK = ASDEX, COMPASS, JET, JFT2M, JT60U or TEXTOR then
if TAUDIA missing then a (II.3) = 0.

II.4 No pellet discharges.
a (II.4) = 1
if PELLET = H or D then a (II.4) = 0

II.5 Weak dW/dt criterion (applied to either MHD or DIA).
a (II.5) = 1
if TOK = AUG, CMOD, D3D, PBXM or PDX then
if NOT (-0.05 <= DWMHD/PABST <= 0.35) then a (II.5) = 0
if TOK = ASDEX, COMPASS, JET, JFT2M, JT60U or TEXTOR then
if DWDIA not missing and NOT (-0.05 <= DWDIA/PABST <= 0.35) then a (II.5) = 0.
if TOK = JET and PREMAG = NO then
if (-0.05 <= DWDIA/PABST <= 0.35) then a (II.5) = 1

II.6 Radiation criterion.
a (II.6) = 1
if PRAD/PABST > 0.6 then a (II.6) = 0
if TOK = D3D then
if SHOT = 62950 and TIME = 3.10 then a (II.6) = 0
if SHOT = 64446 and TIME = 3.45 then a (II.6) = 0
if SHOT = 64514 and TIME = 3.15 then a (II.6) = 0
if SHOT = 64514 and TIME = 2.05 then a (II.6) = 0
if SHOT = 64519 and TIME = 2.06 then a (II.6) = 0
if SHOT = 64523 and TIME = 2.02 then a (II.6) = 0
if SHOT = 62879 and TIME = 2.49 then a (II.6) = 0
if SHOT = 67801 and TIME = 2.50 then a (II.6) = 0
if SHOT = 62881 and TIME = 2.44 then a (II.6) = 0
end of D3D exception
if TOK = JET then
if PRAD missing then a (II.6) = 0
if SHOT = 17010 and PRAD missing a (II.6) = 1
if SHOT = 22332 and PRAD missing a (II.6) = 1
if SHOT = 23201 and PRAD missing a (II.6) = 1
if SHOT = 23206 and PRAD missing a (II.6) = 1
end of JET exception
if TOK = JFT2M and PRAD missing then a (II.6) = 0
if TOK = PBXM and PRAD missing then a (II.6) = 0

II.7 Q95 or Ip/Bt limit.
if TOK = JET and Q95 missing then
$Q95=5 \{AMIN^2 |BT| / (RGEO |IP| / 10^6)\} (1/2) (1 + KAPPA^2) (1 + 3\, AMIN^2 / (2\, RGEO^2))$
a (II.7) = 1
if TOK = ASDEX and Q95 < 3.1 then a (II.7) = 0
if TOK = AUG and Q95 < 3.1 then a (II.7) = 0
if TOK = COMPASS and Q95 < 3.1 then a (II.7) = 0
if TOK = CMOD and Q95 < 3.1 then a (II.7) = 0
if TOK = D3D and |IP/BT| > 10^6 A/T then a (II.7) = 0
if TOK = JET and Q95 < 3.1 then a (II.7) = 0
if TOK = JFT2M and Q95 < 2.7 the a (II.7) = 0
if TOK = JT60U and Q95 < 3.1 then a (II.7) = 0

if TOK = TEXTOR and Q95 < 3.1 then a (II.7) = 0

II.8 Fast ion energy limit

a (II.8) = 1
if (WFFORM + WFICRH)/WMHD > 0.4 then a (II.8) = 0
if TOK = D3D and WFFORM missing then
    if (WMHD-WKIN)/WMHD > 0.4 then a (II.8) = 0
end of D3D exception
if TOK = JET and PREMAG = NO then
    a (II.8) = 1
    if (WFFORM + WFICRH) /WDIA > 0.4 then a (II.8) = 0
end of JET exception

II.9 Beta-limit + no Hot-ion H-modes.

BCR = 10^{-8} |IP| / (AMIN |BT|)
a (II.9) = 1
if TOK = PBXM and BETMHD >= 4 BCR then a (II.9) = 0
if TOK = PDX and BETMHD >= 2.8 BCR then a (II.9) = 0
if TOK = D3D then
    if TI0 >= 8×10^3 eV then a (II.9) = 0
end D3D
if TOK = JET then
    if TI0 > 11×10^3 eV and TI0 > TE0 + 4×10^3 eV then a (II.9) = 0
    if TICX0 > 11×10^3 eV and TICX0 > TE0 + 4×10^3 eV then a (II.9) = 0
end JET

II.10 No JET 1987 data.

a (II.10) = 1
if TOK = JET and 870101 < = DATE < = 871231 then a (II.10) = 0.

165: SELDB2X: Flagging variable for extra selection criteria in DB.2
Notice, can only be different from zero for observations that were in DB.2.
(PABST = POHM + PNBI + PECRH + PICRH).

SELDB2X=Σ a(II.n) $\times$ $10^{(n-11)}$, n=11-20

II.11 High compression ratio (applies only to PDX).

a (II.11) = 1
if TOK = PDX and DALFDV/DALFMP <= 4 then a (II.11) = 0

II.12 No hot-ion H-modes.

a (II.12) = 1
if TOK = D3D then
    if TI0 >= 8×10^3 eV then a (II.12) = 0
end D3D
if TOK = JET then
    if TI0 > 11×10^3 eV and TI0 > TE0 + 4×10^3 eV then a (II.12) = 0
    if TICX0 > 11×10^3 eV and TICX0 > TE0 + 4×10^3 eV then a (II.12) = 0
end JET

II.13 ELMs (any kind).

a (II.13) = 0
if PHASE = HGELM, HSELM, HGELMH or H1 then a (II.13) = 1

II.14 Strong auxiliary heating (K. Riedel, Nuclear Fusion 32 (1992) 1270).
a (II.14) = 1
if 1V ´ |IP|/PABST >= 0.4 then a (II.14) = 0

II.15 Stationary density (K. Riedel, Nuclear Fusion 32 (1992) 1270).
a (II.15) = 1
if TOK = AUG, CMOD, D3D, PBXM or PDX then
  if DNELDT ´ TAUMHD/NEL >= 0.4 then a (II.15) = 0
if TOK = ASDEX, COMPASS, JET, JFT2M, JT60U or TEXTOR then
  if DNELDT ´ TAUDIA/NEL >= 0.4 then a (II.15) = 0

II.16 Strong dW/dt criterion (either MHD or DIA).
a (II.16) = 1
if TOK = AUG, CMOD, D3D, PBXM or PDX then
  if NOT (-0.05 <= DWMHD/PABST <= 0.2) then a (II.16) = 0
if TOK = ASDEX, COMPASS, JET, JFT2M, JT60U or TEXTOR then
  if NOT (-0.05 <= DWDIA/PABST <= 0.2) then a (II.16) = 0

II.17 Old low Q95 limit (used in DB1, CHRISTIANSEN, J.P., et al., Nuclear Fusion 32 (1992) 291).
a (II.17) = 1
if TOK = ASDEX and Q95 < 3.1 then a (II.17) = 0
if TOK = D3D and Q95 < 3.1 then a (II.17) = 0
if TOK = JET and Q95 < 3.1 then a (II.17) = 0
if TOK = JFT2M and Q95 < 2.7 then a (II.17) = 0

II.18 No beryllisation.
a (II.18) = 1
if EVAP = BE then a (II.18) = 0

II.19 No boronisation.
a (II.19) = 1
if EVAP = BO, BOR, BOROA, BOROB, BOROC, B2D6 or DECABORA
  then a (II.19) = 0

II.20 No carbonization.
a (II.20) = 1
if EVAP = CARB or CARBH then a (II.20) = 0

166. IAEA92: Standard dataset flag.
Notice, can only be different from zero for observations that were in DB.2.
Possible values are:

1	For ELMy observations included in the subset of upon which ITERH92-P(y) is based see **KARDAUN, O.J.W.F., et. al., Plasma Phys. Control. Nucl. Fus. Res. 3 (1993) 251.**
0	All other observations

167. DB2P5: Standard dataset flag.
Notice, can only be different from zero for observations that were in DB.3v5.
Possible values are:

1	For ELMy observations included in the subset DB2.5 as defined in JET Report **JET P(98)17** or **ITER PHYSICS BASIS Ch. 2, Nuclear Fusion 39 (1999) 2175**
0	All other observations

168. DB2P8: Standard dataset flag.
Notice, can only be different from zero for observations that were in DB.3v5.
Possible values are:

1	For ELMy observations included in the subset DB2.8 as defined in JET Report **JET P(98)17** or **ITER PHYSICS BASIS Ch. 2, Nuclear Fusion 39 (1999) 2175**
0	All other observations

169. DB3IS: Standard dataset flag.
Notice, can only be different from zero for observations that were in DB.3v5.
Possible values are:

1	For ELMy observations included in the subset DB3r(IS) as defined in JET Report **JET P(98)17** or **ITER PHYSICS BASIS Ch. 2, Nuclear Fusion 39 (1999) 2175**
0	All other observations

170. DB3V5: Standard dataset flag.
Notice, can only be different from zero for observations that were in DB.3v5.
Possible values are:

1	Standard dataset selection for version DB3v5 used in JET Report **JET P(98)17** or **ITER PHYSICS BASIS Ch. 2, Nuclear Fusion 39 (1999) 2175**
0	All other observations

171. IAE2000N: Standard dataset flag.
See SELDB3X for selection details.
Possible values are:

1	Small IAEA2000 standard dataset as defined in **Kardaun, O.J.W.F., et. al., Fusion Energy 2000 (Proc. 18th Int. Conf. Sorrento, 2000), IAEA, Vienna (2001)**
0	All other observations

172. IAE2000X: Standard dataset flag.
See SELDB3X for selection details.
Possible values are:

1	Large IAEA2000 standard dataset as defined in **Kardaun, O.J.W.F., et. al., Fusion Energy 2000** **(Proc. 18th Int. Conf. Sorrento, 2000), IAEA, Vienna (2001)**
0	All other observations

173. HMWS2003: Standard dataset flag.
See SELDB3X for selection details.
Possible values are:

1	Deuterium only standard dataset as defined in **Kardaun, O.J.W.F., et. al., H-mode Workshop, San Diego, 2003**
0	All other observations

174. IAE2004S: Standard dataset flag.
See SELDB3X for selection details.
Possible values are:

1	IAEA2004 standard dataset as defined in **Cordey, J.G., et. al., Fusion Energy 2004** **(Proc. 20th Int. Conf. Vilamoura, 2004), IAEA, Vienna (2004)**
0	All other observations

175. IAE2004I: Standard dataset flag.
See SELDB3X for selection details.
Possible values are:

1	ITER like standard dataset as defined in **Cordey, J.G., et. al., Fusion Energy 2004** **(Proc. 20th Int. Conf. Vilamoura, 2004), IAEA, Vienna (2004)**
0	All other observations

176. DB3DONLY: Standard dataset flag.
See SELDB3X for selection details.
Possible values are:

1	Deuterium only standard dataset as defined in **McDonald, D.C. et.al. NF.......**
0	All other observations

177. HMWS2005: Standard dataset flag.
See SELDB3X for selection details.
HMWS2005 = 0;
IF aIII.15=1 then do;
If 1.599999=<kappa =<2.43 and
1.6=<meff=<2.4 then HMWS2005 = 1;
If tok='TCV' or
tok='JT60U' then HMWS2005 = 0;
end;
Possible values are:

1	Standard dataset as defined in 2005 **H-mode Workshop paper** **Kaye, S., et. al., St. Petersburg, Russia, September 2005** This set includes 36 PBXM data points.
0	All other observations

178. OJK2006: Standard dataset flag.
Possible values are:

1	Standard dataset as defined in **Kardaun, O. et.al........**
0	All other observations

179. SELDB3: Flagging variable for new standard selection
(PABST = POHM + PNBI + PECRH + PICRH).
SELDB3=S a(III.n) ´ 10$^{(n-1)}$, n=1-10.

III.1 H-mode criterion.
a (III.1) = 0
if PHASE = H, HSELM, HSELMH, H1, HGELM, HGELM?, HGELMH, HYSELM or HYGELM
  then a (III.1) = 1
*** exceptions ***
if TOK=COMPASS then
  if SHOT = 24787 then a (III.1) = 0
  if AUXHEAT = ECOA then a (III.1) = 0
end of COMPASS exception
if TOK=AUG then
  if SHOT = 8175 and 1.49 < TIME < 1.51 then a (III.1) = 0
  if SHOT = 8255 and 1.64 < TIME < 1.66 then a (III.1) = 0

end of AUG exception

III.2 No missing confinement data.
a (III.2) = 1
if TAUTH ´ RGEO ´ AMIN ´ KAPPA ´ abs(IP) ´ abs(BT) ´ MEFF ´ NEL ´ PLTH is not defined
  then a (III.2) = 0;

III.3 No pellet discharges.
a (III.3) = 1
if PELLET = H or D
  then a (III.3) = 0
if PELLET ^{1} NONE
  then a (III.3) = 0

III.4 Weak dW/dt criterion.
a (III.4) = 1
*** based on DWMHD ***
if TOK = AUG, CMOD, D3D, PBXM, PDX, TCV, TDEV, TFTR, T10, START or MAST then
  if NOT (-0.05 <= DWMHD/PABST <= 0.35) then a (III.4) = 0
*** based on DWDIA ***
if TOK = ASDEX, COMPASS, JFT2M, JT60U, TEXTOR, TFTR or TUMAN3M then
  if NOT (-0.05 <= DWDIA/PABST <= 0.35) then a (III.4) = 0.
*** exception ***
if TOK = JET then
  *** based on DWMHD ***
  if SHOT <= 27968 and PREMAG ^{1} NO then
    if NOT(-0.05 <= DWMHD/PABST <= +.35) then a (III.4) =0
  *** based on DWDIA ***
  if SHOT > 27968 or PREMAG = NO then
    if NOT(-0.05 <= DWDIA/PABST <= +.35) then a (III.4) =0
end of JET exception

III.5 Radiation criterion.
a (III.5) = 1
if PRAD/PABST > 0.6
  then a (III.5) = 0
*** exceptions ***
if TOK = CMOD then
  if SHOT = 960116029 and 0.85 <= TIME <= 0.95 then a (III.5) =0
end of CMOD exception
if TOK = D3D then
  if SHOT = 62950 and 3.09 <= TIME <= 3.11 then a (III.5) = 0
  if SHOT = 64446 and 3.44 <= TIME <= 3.46 then a (III.5) = 0
  if SHOT = 64514 and 3.14 <= TIME <= 3.16 then a (III.5) = 0
  if SHOT = 64514 and 2.04 <= TIME <= 2.06 then a (III.5) = 0
  if SHOT = 64519 and 2.05 <= TIME <= 2.07 then a (III.5) = 0
  if SHOT = 64523 and 2.01 <= TIME <= 2.03 then a (III.5) = 0
  if SHOT = 62879 and 2.48 <= TIME <= 2.51 then a (III.5) = 0
  if SHOT = 67801 and 2.49 <= TIME <= 2.51 then a (III.5) = 0
  if SHOT = 62881 and 2.43 <= TIME <= 2.45 then a (III.5) = 0
end of D3D exception
if TOK = JET then
  if PRAD missing then a (III.5) = 0
  if SHOT = 17010 and PRAD missing then a (III.5) = 1

if SHOT = 22332 and PRAD missing then a (III.5) = 1
if SHOT = 23201 and PRAD missing then a (III.5) = 1
if SHOT = 23206 and PRAD missing then a (III.5) = 1
end of JET exception
if TOK = JFT2M and PRAD missing then a (III.5) = 0
if TOK = PBXM and PRAD missing then a (III.5) = 0
if TOK = START and PRAD missing then a (III.5) = 1
if TOK = TUMAN3M and PRAD missing then a (III.5) = 1

III.6 Q95 or Ip/Bt limit.
*** temporary estimates of Q95 ***
if TOK = JET or TUMAN3M and Q95 missing then
$Q95=5 \{AMIN^2 |BT| / (RGEO |IP| / 10^6)\} (1/2) (1 + KAPPA^2) (1 + 3 AMIN^2 / (2 RGEO^2))$
*** ************************
a (III.6) = 1
if TOK = ASDEX and Q95 < 2.2 then a (III.6) = 0
if TOK = AUG and Q95 < 2.5 then a (III.6) = 0
if TOK = CMOD and Q95 < 2.5 then a (III.6) = 0
if TOK = COMPASS and Q95 < 2.5 then a (III.6) = 1
if TOK = COMPASS and SHOT = 11768 then a (III.6) = 1
if TOK = D3D and |IP/BT| > 10^6 A/T then a (III.6) = 0
if TOK = JET and Q95 < 2.5 then a (III.6) = 0
if TOK = JFT2M and Q95 < 2.7 the a (III.6) = 0
if TOK = JT60U and Q95 < 2.5 then a (III.6) = 0
if TOK = TCV and Q95 < 2.2 then a (III.6) = 0
if TOK = TEXTOR and Q95 < 2.5 then a (III.6) = 0
if TOK = TFTR and Q95 < 2.2 then a (III.6) = 0
if TOK = TDEV and Q95 < 2.2 then a (III.6) = 0
if TOK = START and Q95 < 2.5 then a (III.6) = 0
if TOK = T10 and Q95 < 2.2 then a (III.6) = 0
if TOK = TUMAN3M and Q95 < 2.2 then a (III.6) = 0
if TOK = MAST and Q95 < 2.5 then a (III.6) = 0

III.7 Fast ion energy limit
a (III.7) = 1
*** based on WMHD ***
if TOK = D3D, PBXM, PDX, JFT2M, ASDEX, AUG, CMOD, TCV or MAST then
if (WFFORM + WFICRH)/WMHD > 0.40 then a(III.7) = 0
*** based on WDIA ***
if TOK = COMPASS, JT60U or TEXTOR then
if (WFFORM + WFICRH)/WDIA > 0.40 then a(III.7) = 0
*** exceptions ***
if TOK = JT60U and (WFFORM + WFICRH)/WDIA < 0.50 then a(III.7) = 1
if TOK = D3D and WFFORM missing then
if (WMHD-WKIN)/WMHD > 0.40 then a(III.7) = 0
end D3D exception
if TOK = JET then
if SHOT <= 27968 and PREMAG ^{1} NO and (WFFORM + WFICRH)/WMHD > 0.40
then a(III.7) = 0
if SHOT > 27968 or PREMAG = NO and (WFFORM + WFICRH)/WDIA > 0.40
then a(III.7) = 0
end JET exception

III.8 Beta - limit.

BCR = 10^{-8} |IP| / (AMIN |BT|)
a (III.8) = 1
if TOK = PBXM and BETMHD >= 4 ´ BCR then a (III.8) = 0
if TOK = PDX and BETMHD >= 2.8 ´ BCR then a (III.8) = 0

III.9 No Hot-ion H-modes.
a (III.9) = 1
if TOK = D3D then
  if TI0 >= 8 ´ 10^3 eV then a (III.9) = 0
end D3D
if TOK = JET then
  if TI0 > 11 ´ 10^3 eV and TI0 > TE0 + 4 ´ 10^3 eV then a (III.9) = 0
  if TICX0 > 11 ´ 10^3 eV and TICX0 > TE0 + 4 ´ 10^3 eV then a (III.9) = 0
end JET
if TOK = TFTR then
  if TI0 > 11 ´ 10^3 eV and TI0 > TE0 + 4 ´ 10^3 eV then a (III.9) = 0
end TFTR

III.10 No JET 1987 data.
a (III.10) = 1
if TOK = JET and 870101 < = DATE < = 871231 then a (III.10) = 0.

180. SELDB3X: Flagging variable for extra selection criteria in DB.3
SELDB3X=S a(III.n) ´ $10^{(n-11)}$, n=11-16.

III.11 Data withdrawn from current version (SELDB3 a(III.1) = 0).
a (III.11) = 0
if TOK = AUG then
  if SHOT = 8175 and 1.49 <= TIME <= 1.51 then a(III.11) = 1
  if SHOT = 8255 and 1.64 <= TIME <= 1.66 then a(III.11) = 1
end AUG exception
if TOK = COMPASS then
  if SHOT = 24787 then a(III.11) = 1
  if AUXHEAT = ECOA then a(III.11) = 1
end COMPASS exception

III.12 Strong gas puff data.
a (III.12) = 0
if PELLET ¹ NONE then do
  a (III.12) = 1
  if PELLET = H or PELLET = D then a(III.12) = 0
end

III.13 Limit temperature ratio TI0/TE0.
a (III.13) = 0
teirat = TI0/TE0
if 0.4 <= teirat <= 2.5 then a (III.13) = 1
** Assume data within limits if data not available
if teirat missing then a (III.13) = 1;

III.14 Limit internal inductance l_i.
a (III.14) = 0

l_i = 2*(BEILI2-BEIMHD)
if l_i <= 2 then a (III.14) = 1
** Assume data within limits if data not available
if l_i missing then a (III.14)=1;

III.15 Large IAEA2000 standard dataset equivalent .(Kardaun, O.J.W.F., et. al., Fusion Energy 2000 (Proc. 18th Int. Conf. Sorrento, 2000), IAEA, Vienna (2001))..

a (III.15) = 0
** usual standard dataset
if SELDB3 = 1111111111 then a (III.15) = 1
** include gas puff data (SELDB3X = ????????10)
if a (III.11) = 0 and a (III.12) = 1 and SELDB3 = 1111111011 then a (III.15) = 1
** consider all TFTR data
if TOK = TFTR then a (III.15) = 1
** weaken the non-stationarity criteria for TFTR
if TOK = TFTR then do
  if NOT (-0.10 <= DWMHD/PL < 0.35) then a (III.15) = 0
end
** only ELMy data
if substr(PHASE,1,1) ^{1} H then a (III.15) = 0
if PHASE = H then a (III.15) = 0
** exclude JET museums shots
if TOK = JET and SHOT = 19971 then a (III.15) = 0
if TOK = JET and SHOT = 43014 then a (III.15) = 0
** limit temperature ratio
a (III.15) = a (III.15) ´ a (III.13)
** exclude high l_i shots
a (III.15) = a (III.15) ´ a (III.14)

III.16 Small IAEA2000 standard dataset equivalent.(Kardaun, O.J.W.F., et. al., Fusion Energy 2000 (Proc. 18th Int. Conf. Sorrento, 2000), IAEA, Vienna (2001)).

a (III.16) = 0
** usual standard dataset
if SELDB3 = 1111111111 then a (III.16) = 1
** only ELMy data
if substr(PHASE,1,1) ^{1} H then a (III.16) = 0
if PHASE = H then a (III.16) = 0
** exclude JET museums shots
if TOK = JET and SHOT = 19971 then a (III.16) = 0
if TOK = JET and SHOT = 43014 then a (III.16) = 0
** limit temperature ratio
a (III.16) = a (III.16) ´ a (III.13)
** exclude high l_i shots
a (III.16) = a (III.16) ´ a (III.14)
** exclude Ohmic H-mode data;
if AUXHEAT = NONE then a (III.16) = 0

III.17 Deuterium only HMWS2003 standard dataset.

a (III.17) = 0
** select equivalent of large IAEA2000 std set
if a (III.15) = 1 then a (III.17) = 1
** exclude old elmy jet shots

If TOK='JET' and SHOT<30000 then a (III.17) = 0
** exclude rogue JET shots
if TOK = JET and SHOT = 37854 then a (III.17) = 0
if TOK = JET and SHOT = 37859 then a (III.17) = 0
** limit range in MEFF and PGASA
If NOT (1.833<MEFF<2.167 and PGASA=2) then a (III.17) = 0

III.18 Deuterium only Ohmic HMWS2003 standard dataset.
a (III.18) = 0
** select deuterium only std set
a (III.18) = a (III.17) = 1
** exclude Ohmic data
If AUXHEAT= NONE then a (III.18) = 0

III.19 ITER like IAEA 2004 equivalent standard dataset.
a (III.19) = 0
** select from equivalent of Otto's large IAEA2000 std set a (III.15) = 1
sm=0;
sq=0;
sk=0;
if a (III.15) = 1 then do;
If TOK='COMPASS' then AREA=VOL/(2*3.142*RGEO);
B = abs(BT);
I= abs(IP)/1.e6;
R = RGEO;
a = AMIN;
k2=KAPPAA;
If KAPPAA='.' then k2=AREA/3.1416/(a*a);
qcyl=5*k2*a*a*B/(r*i);

If 1.833<MEFF<2.167 then sm=1;
If 1.6<qcyl<2.8 then sq=1;
If 1.4<k2<1.93 then sk=1;
end;

a (III.19) = sm*sq*sk;

III.20 HMWS2005 equivalent standard dataset.
a (III.20) = 0
** select from equivalent of Otto's large IAEA2000 std set a (III.15) = 1
IF aIII.15=1 then do;
If 1.599999=<kappa =<2.43 and
1.6=<meff=<2.4 then a (III.20) = 1;
If tok='TCV' or
tok='JT60U' then a (III.20) = 0;
end;

181. SELDB4: Flagging variable for new standard selection
SELDB4=S a(IV.n) ´ $10^{(n-1)}$, n=1-10.

IV.1 Hybrid H-mode criterion.
a (IV.1) = 0
if HYBRID = YES, HYBRID or IH then a (IV.1) = 1

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