Summary of disruption DB discussions (IC 2020)

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Past discussions with QST team

A database structure to store relevant information and data for disruption analysis

- EUROfusion DDB as our reference
- Assess results achievable with limited diagnostics
- Support operations by contributing to the definition of a safe operational space for JT-60SA during IC
- Develop a set of tools for querying the database and analyzing data.

→ → lead to definition of draft table of useful quantities, signals, attributes etc available during IC

Table drafted jointly with QST team

Table of Quantities

		1st order - measurable			2nd order - postproc		
		Name	Description	Unit	Name	Description	Unit
Disruption	Current quench	V_{loop}	Loop voltage	[V]	l_i	Internal inductance	[ ]
		I_p	Total plasma current	[A]	τ_{CQ}**	Time of Current Quench	[s]
		B_{t0}	On-axis toroidal field	[T]	S_p	Plasma cross-section [2]	[m^2]
		δB	Magnetic perturbation outside wall [1]	[T]	dI_p/dt	Plasma current derivative	[A/s]
		Φ_d	Diamagnetic flux	[Wb]	q_{95}	Safety factor at 95% poloidal flux	[ ]
		Δb	Plasma radial shift [2]	[m]	δB_{LM}	Locked Mode (LM) amplitude [4]	[T]
					n_{LM}	Locked Mode toroidal mode number	[ ]
					$\beta_{p,t,N}$	Poloidal, toroidal, normalized beta	[ ]
					Z_c	Plasma centroid vertical position	[m]
					dZ/dt	Vertical growth rate	[s^{-1}]
					I_w	Poloidal current in wall [5]	[A]
	Thermal quench	T_e	Electron temperature [3]	[eV]	P_{tot}	Total input power	[W]
		n_e	Line integrated density	[m^{-2}]	P_{rad}	Total radiated power [6]	[W]

Legend	
	Available
	TBD
	Unavailable

[1] no magnetic probes on outside wall

[2] calculated by CSS

[3] estimated by SXR with two Be filters but without the necessary accuracy for this table

[4] could be available but needs analysis

[5] no flux loop outside VV

[6] bolometer not available during IC

Summary & outlook

IC activity on magnetics could still provide relevant information and data for disruption analysis

- Discussion with QST can be resumed to support disruption related tasks
- Interest of QST?

Part of initial 2020 proposal is now out of scope

- Main work of *Disruption mitigation/avoidance trigger*