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# Finding optimal parameters for discharge on tokamak GOLEM

Bouncy discharge

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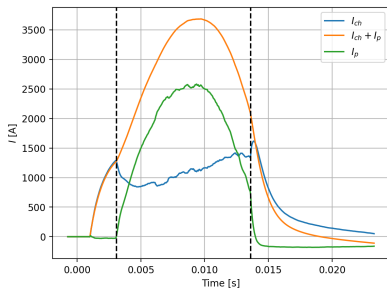
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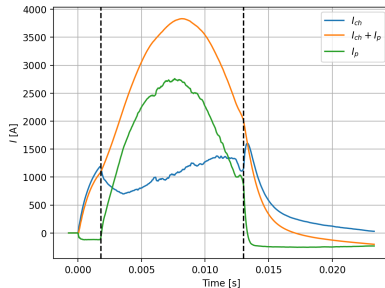
# Optimisation of $t_{cd}$

discharge No	$t_{cd}$ [ms]	$I_{p \max}$ [kA]	$t_p$ [ms]
41550	1	2.57	10.5
41551	0	2.75	11.2
41552	2	no plasma	no plasma
41555	1.5	3.19	12.1

**Table:** Comparison of maximal plasma current  $I_{p \max}$  and plasma duration  $t_p$  for various current drive trigger  $t_{cd}$ . Pressure of working gas  $p_{wG} = 15$  mPa, voltage to charge Toroidal magnetic field capacitor  $U_{B_t} = 800$  V and voltage to charge Current drive field capacitor  $U_{E_{cd}} = 500$  V are constant for all discharges.

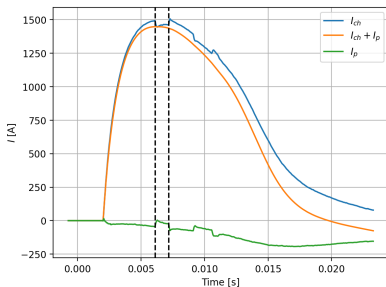


(a) Discharge No 41550.

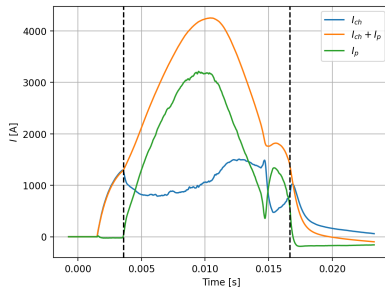


(b) Discharge No 41551.

**Figure:** Dependency of chamber current  $I_{ch}$ , plasma current  $I_p$  and their combination  $I_{p+ch}$  on time.



(a) Discharge No 41552.



(b) Discharge No 41555.

**Figure:** Dependency of chamber current  $I_{ch}$ , plasma current  $I_p$  and their combination  $I_{p+ch}$  on time.

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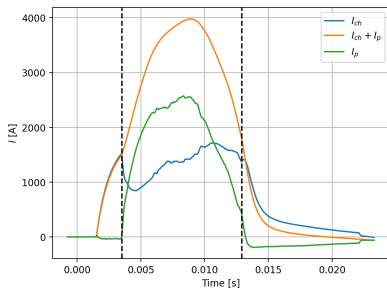
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# Optimisation of $p_{WG}$

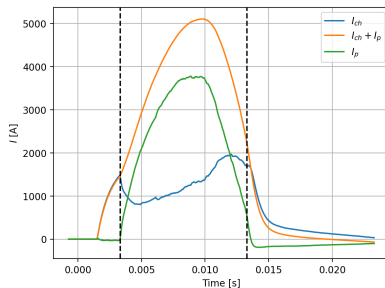
discharge No	$p_{WG}$ [mPa]	$I_{p \max}$ [kA]	$t_p$ [ms]
41736	9.6	2.57	9.39
41745	12.9	3.77	9.96
41742	21.0	3.30	10.11
41739	26.4	3.14	9.93

**Table:** Comparison of maximal plasma current  $I_{p \max}$  and plasma duration  $t_p$  for various values of pressure of working gas  $p_{WG}$ . Current drive trigger  $t_{cd} = 1.5$  ms, voltage to charge Toroidal magnetic field capacitor  $U_{B_t} = 800$  V and voltage to charge Current drive field capacitor  $U_{E_{cd}} = 600$  V are constant for all discharges.



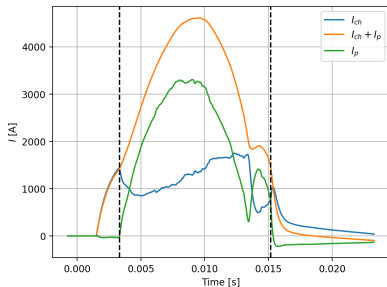


(a) Discharge No 41736.

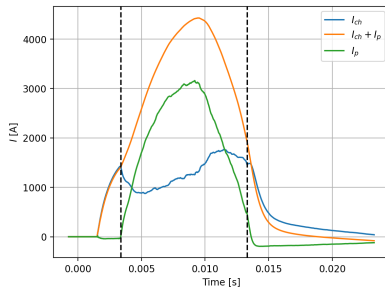


(b) Discharge No 41745.

**Figure:** Dependency of chamber current  $I_{ch}$ , plasma current  $I_p$  and their combination  $I_{p+ch}$  on time.



(a) Discharge No 41742.

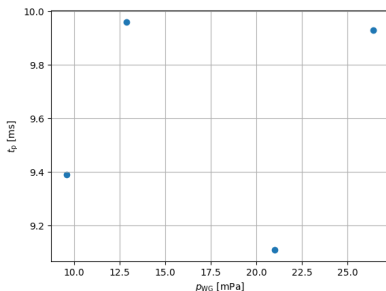


(b) Discharge No 41739.

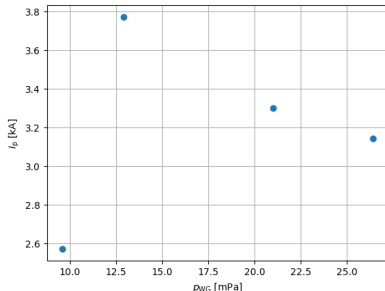
**Figure:** Dependency of chamber current  $I_{ch}$ , plasma current  $I_p$  and their combination  $I_{p+ch}$  on time.

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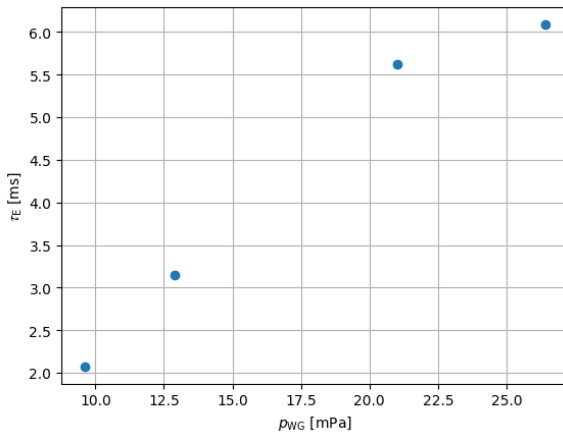


**(a)** Dependency of plasma duration  $t_p$  on pressure of working gas  $p_{WG}$ .



**(b)** Dependency of maximal plasma current  $I_{p \max}$  on pressure of working gas  $p_{WG}$ .

**Figure:** Dependencies of plasma parameters on pressure of working gas  $p_{WG}$ .



**Figure:** Dependency of confinement time  $\tau_E$  on pressure of working gas  $p_{WG}$ .

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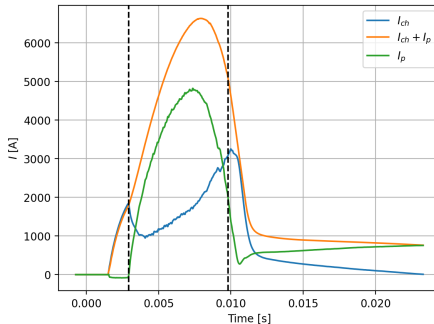
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# Highest $I_p$ max



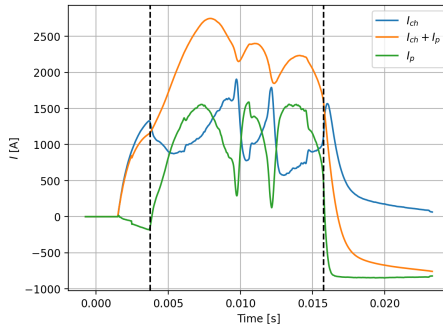
**Figure:** Discharge with plasma current  $I_p \text{ max} = 4.82 \text{ kA}$ .



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**Figure:** Discharge with plasma duration  $t_p = 13.5$  ms.