

# Stato operazioni FTU

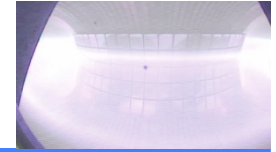
FTU Experimental Campaign 2019-C1-B  
**Week 27 (July01-05, 2019)**

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O.D'Arcangelo, O. Di Troia, M. Iafrati,  
G.Ramogida, O.Tudisco

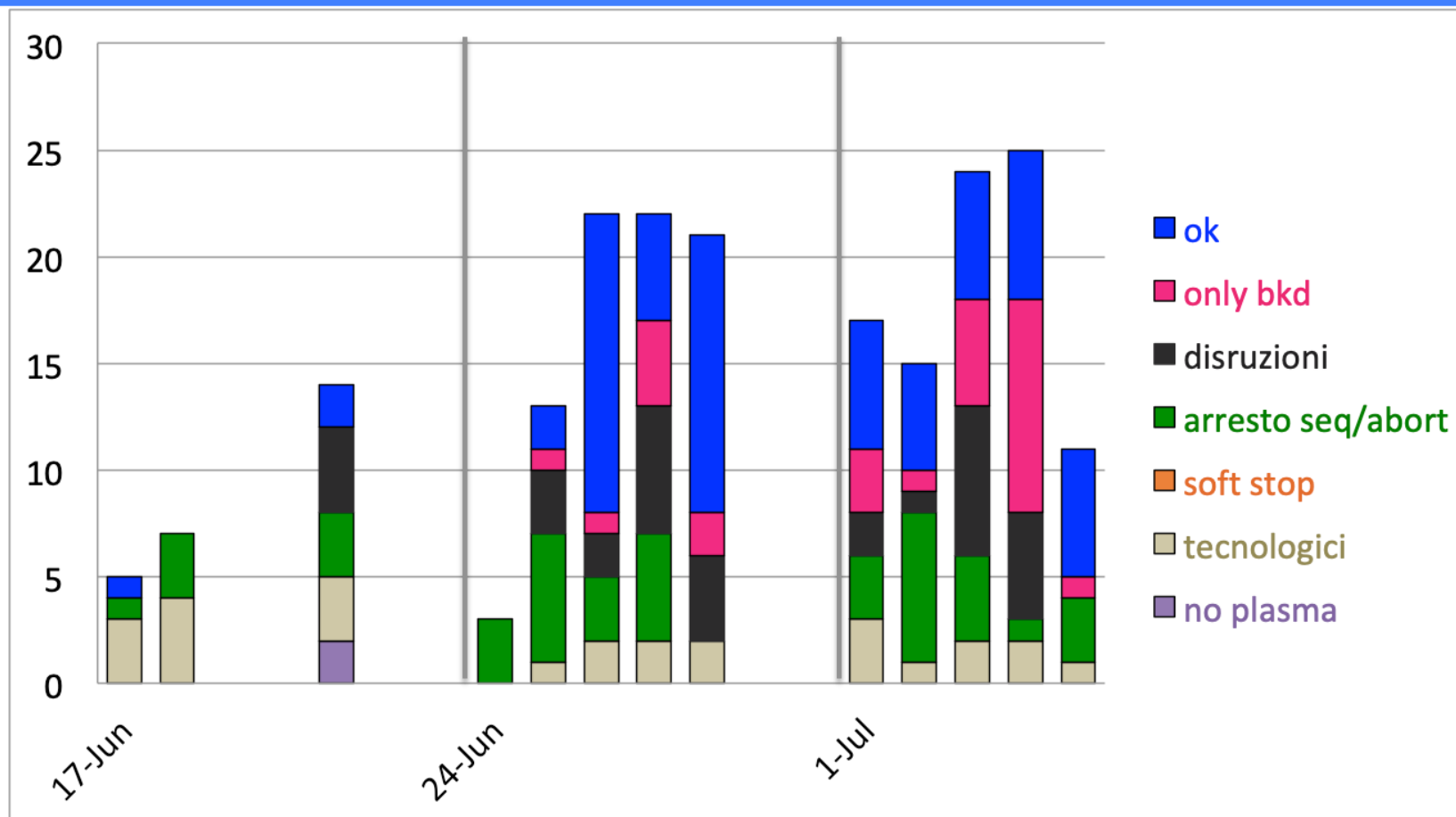
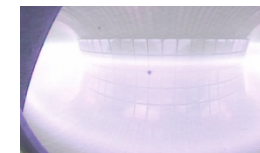


# Week summary



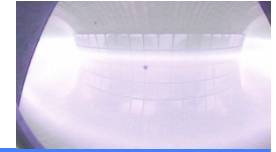
| Week 27   | Program                                           | Notes                                                                                                                                                                                                                                                                                                      |
|-----------|---------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 01/07 Mon | <i>Restart</i>                                    | <b>Machine status: IC1A on, reduced RC filter of T, switching network off, H coil off</b> <ul style="list-style-type: none"> <li>- 17 shots</li> <li>- Test IC1A =&gt; arresto sequenza OK!</li> <li>- Test pol. movement launcher port 8, ok!</li> <li>- Rampa di campo 4.9-6T (#43117-#43118)</li> </ul> |
| 02/07 Tue | <i>MHD Limit Cycles<br/>TM excitation by ECWs</i> | <b>Start at 9.00</b> , problemi eccitatrice G3 <ul style="list-style-type: none"> <li>- 15 shots (4 abort, 3 arresto seq)</li> <li>- h 15.00 <b>short-circuited IC1A</b></li> </ul>                                                                                                                        |
| 03/07 Wen | <i>TM stab by EC<br/>sweeping</i>                 | <b>H coil on</b><br><b>Start at 10.00</b> , after IC1A inspection and work on compressed air of switching network <ul style="list-style-type: none"> <li>- 24 shots</li> </ul>                                                                                                                             |
| 04/07 Thu | <i>Collective TS</i>                              | <ul style="list-style-type: none"> <li>- 25 shots,</li> <li>- Feedback problem after zero shot</li> </ul>                                                                                                                                                                                                  |
| 05/07 Fri | <i>Collective TS<br/>Liquid Metal Limiters</i>    | <b>Start at 12.30</b> , allarmi temperatura olio G1 <ul style="list-style-type: none"> <li>- 11 shots</li> <li>- cooling alarms</li> </ul>                                                                                                                                                                 |

# Shot statistics



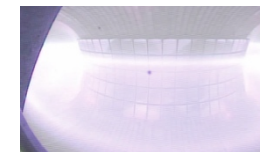
- Arresto seq del 1/7: test IC1A senza un relè => protezione interviene correttamente
- Abort del 2/7: stato errato di HE-3 e mancato consenso convertitori
- Arresto seq del 2/7: apertura anticipata interruttore IC1A (rimasto in locale dopo controllo su IC1)
- Arresto sequenza del 3/7: IM1 non si chiude

# Criticità riscontrate



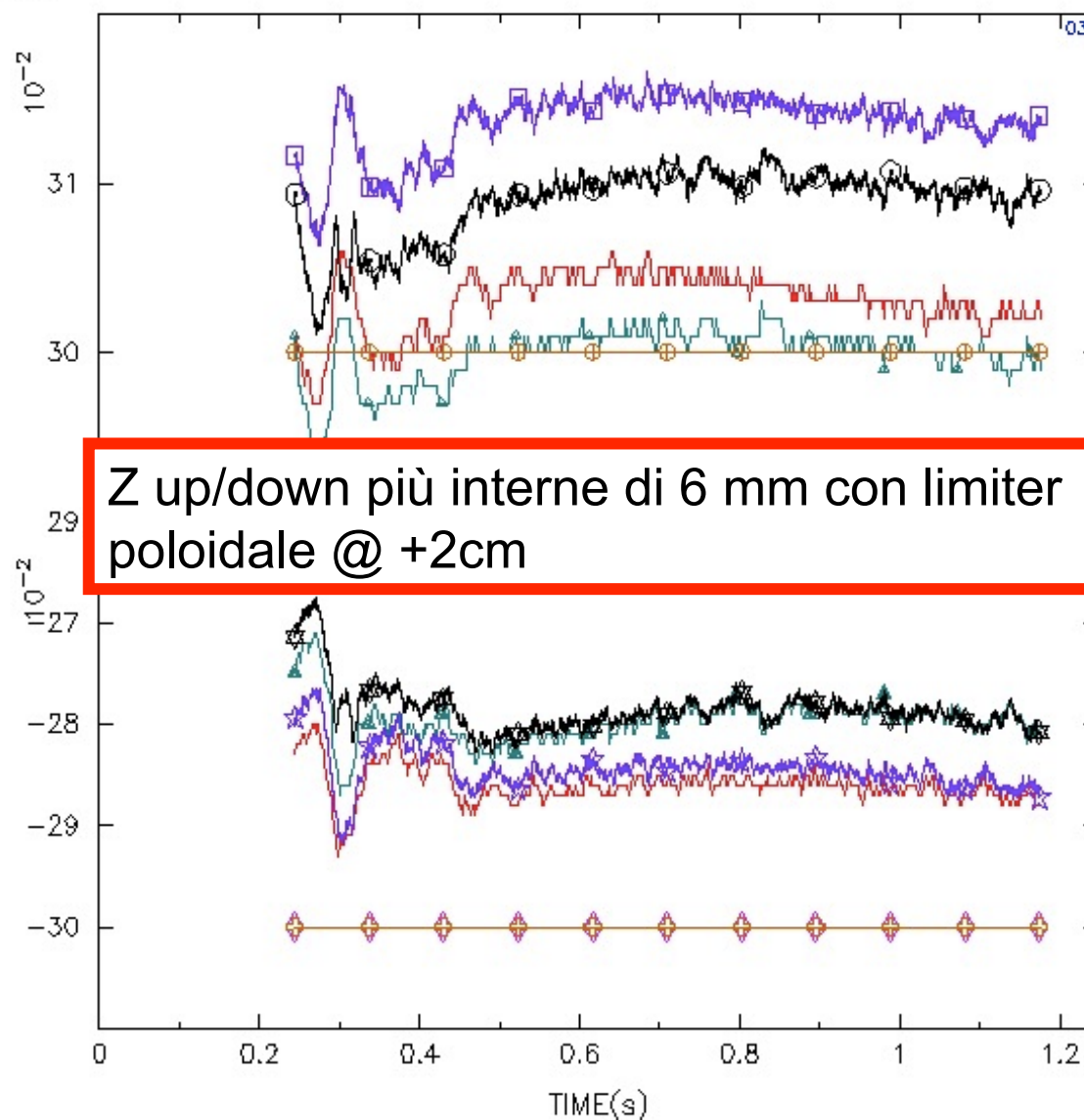
- Aborto sparo per apertura HE-3 (problema consensi PLC)
- Cooling G3 per falsa misura temperatura scambiatore olio
- Apertura anticipata IC1A => arresto sequenza
  - Pausa mar 2/7 per cortocircuito IC1A
- Ispezione a IC1A (merc 3/7)
- Arresto sequenza per mancanza aria compressa commutazione
- Aborto sparo per mancata apertura IM1 (rimasto in locale dopo ispezione IC1A)
- Aborto sparo/Ritardi per blocco MARTE dopo shot di zero (3-4/7)

# Lun 1/7: 5.3T/500kA con/senza limiter poloidale +2cm



rdoftu  
6:13  
2.Jul.19

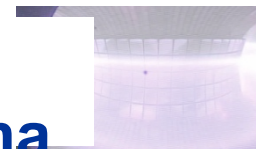
## #43110 vs #43112



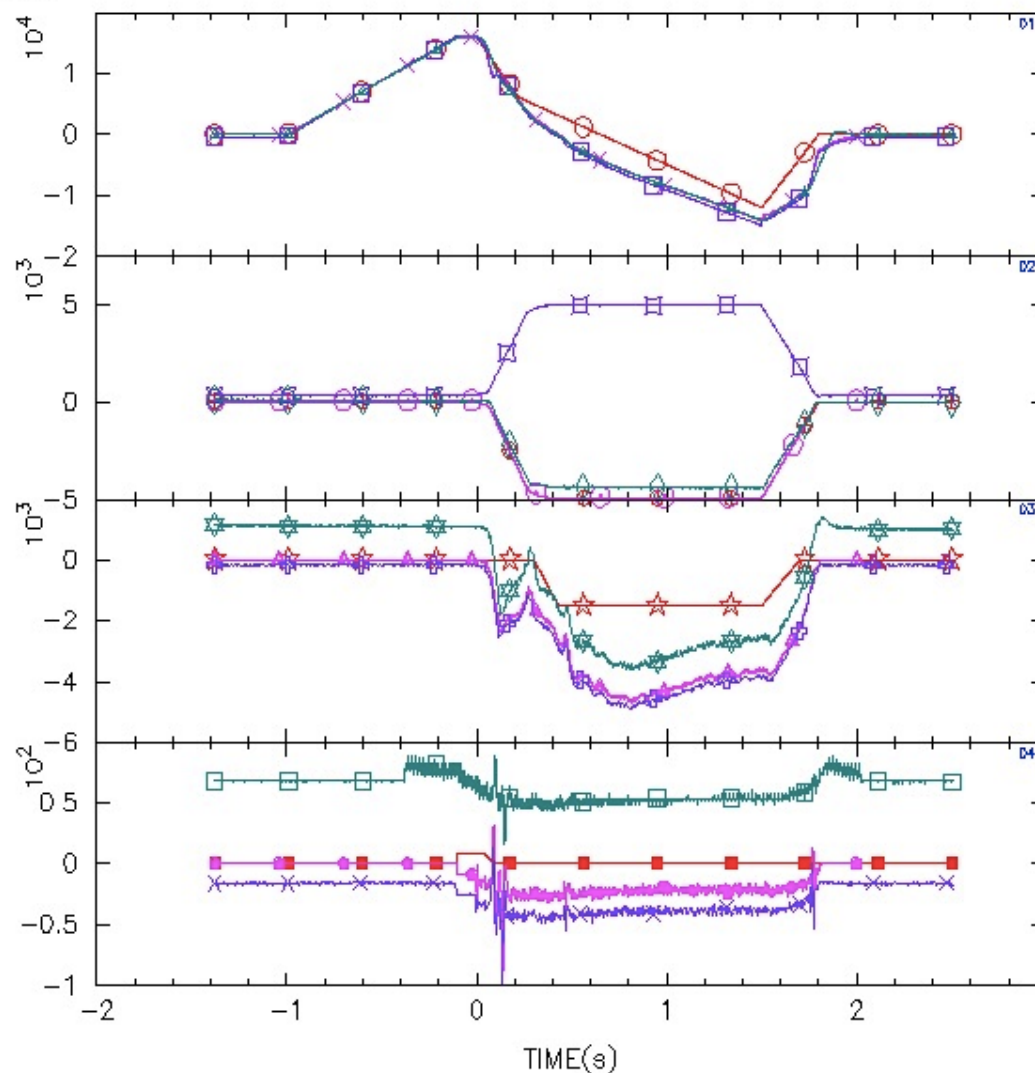
|                |      |
|----------------|------|
| 43110          | 03/A |
| \$EQVZMAX      |      |
| ZMAX_MAGNETICS |      |
| 43110          | 03/B |
| %E.ZUP_PREP    |      |
| Prepr.upper_Z  |      |
| 43110          | 03/E |
| □ MARTEFE.Z1   |      |
| 43112          | 03/G |
| △ \$EQVZMAX    |      |
| ZMAX_MAGNETICS |      |
| 43112          | 03/H |
| ⊕ %E.ZUP_PREP  |      |
| Prepr.upper_Z  |      |
| 43112          | 03/K |
| ○ MARTEFE.Z1   |      |
| 43110          | 04/C |
| \$EQVZMIN      |      |
| ZMIN_MAGNETICS |      |
| 43110          | 04/D |
| ◇ %E.ZLO_PREP  |      |
| Prepr.lower_Z  |      |
| 43110          | 04/F |
| ☆ MARTEFE.Z2   |      |
| 43112          | 04/I |
| ▲ \$EQVZMIN    |      |
| ZMIN_MAGNETICS |      |
| 43112          | 04/J |
| ⊕ %E.ZLO_PREP  |      |
| Prepr.lower_Z  |      |
| 43112          | 04/L |
| ★ MARTEFE.Z2   |      |

# Mar 2/7: H funziona, #43127-43128

## sostituita una scheda ma non era stato testato sistema

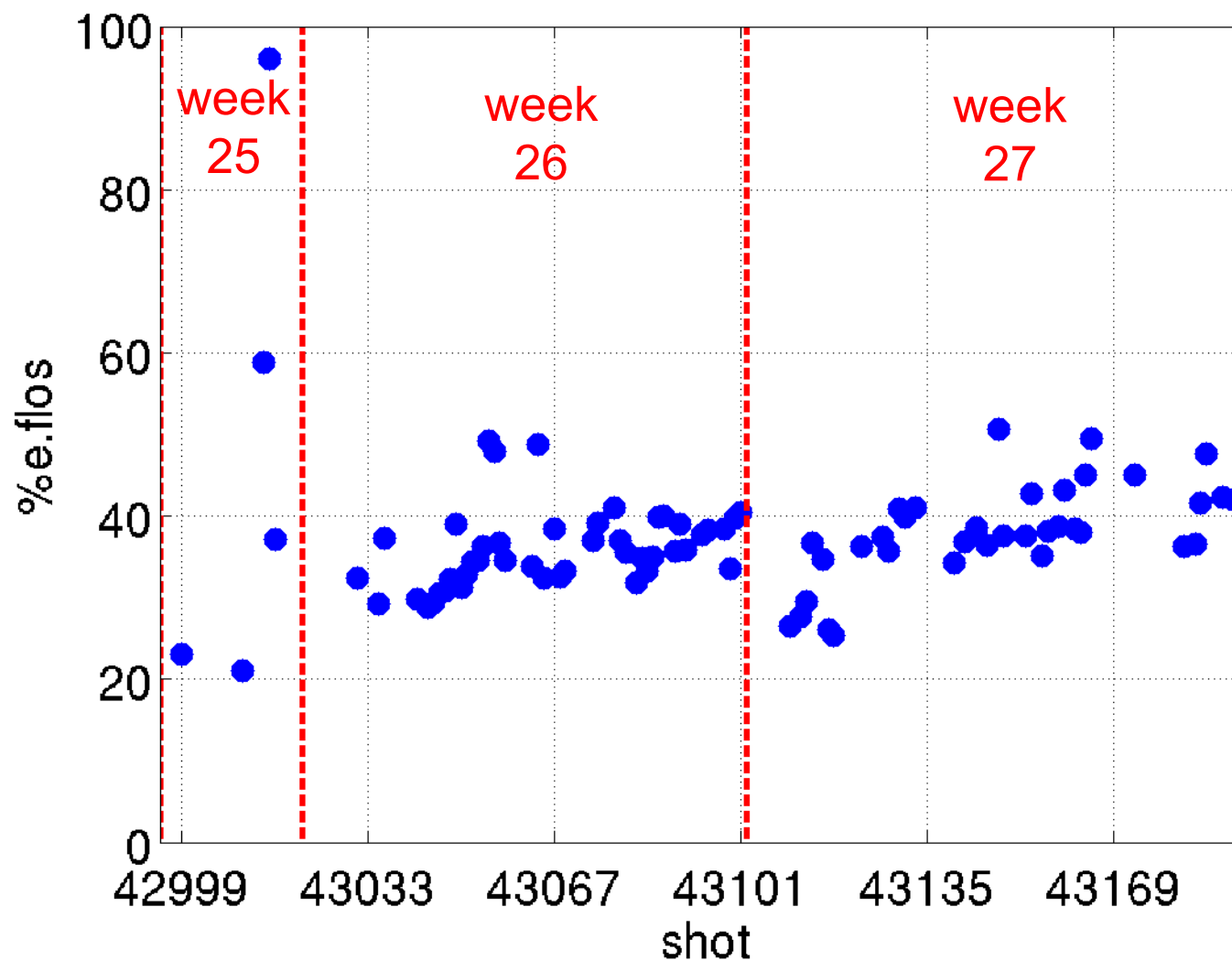
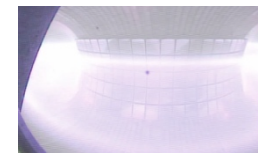


rdofu  
11:37  
4.Jul.19



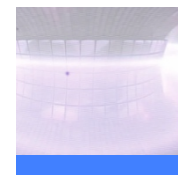
|                     |      |
|---------------------|------|
| 43127               | 01/A |
| ○ %E.TRPREP         |      |
| Programmed_IT       |      |
| 43127               | 01/G |
| × MARTEFE.FBCOR_ALT |      |
| 43127               | 01/O |
| □ D.SHOT.ALTV_R     |      |
| I Rif corrente      |      |
| 43127               | 01/S |
| △ D.SHOT.ztm=i      |      |
| I avv T misura      |      |
| 43127               | 02/B |
| ■ %E.VPREP          |      |
| Programmed_IV       |      |
| 43127               | 02/H |
| ○ MARTEFE.FBCOR_ALV |      |
| 43127               | 02/P |
| □ D.SHOT.ALTV_R     |      |
| 43127               | 02/T |
| ◇ D.SHOT.zvm=i      |      |
| I avv V misura      |      |
| 43127               | 03/C |
| ★ %E.FPREP          |      |
| Programmed_IF       |      |
| 43127               | 03/E |
| △ MARTEFE.FBCOR_ALF |      |
| 43127               | 03/M |
| ◇ D.SHOT.ALTV_R     |      |
| 43127               | 03/G |
| ☆ D.SHOT.ztm=i      |      |
| I avv F misura      |      |
| 43127               | 04/D |
| ■ %E.HPREP          |      |
| PROGRAMMED_IH       |      |
| 43127               | 04/F |
| ◇ MARTEFE.FBCOR_ALH |      |
| 43127               | 04/N |
| × D.SHOT.ALTV_R     |      |
| I Rif corrente      |      |
| 43127               | 04/R |
| □ D.SHOT.ztm=i      |      |
| I avv H misura      |      |

# Radiated power statistics

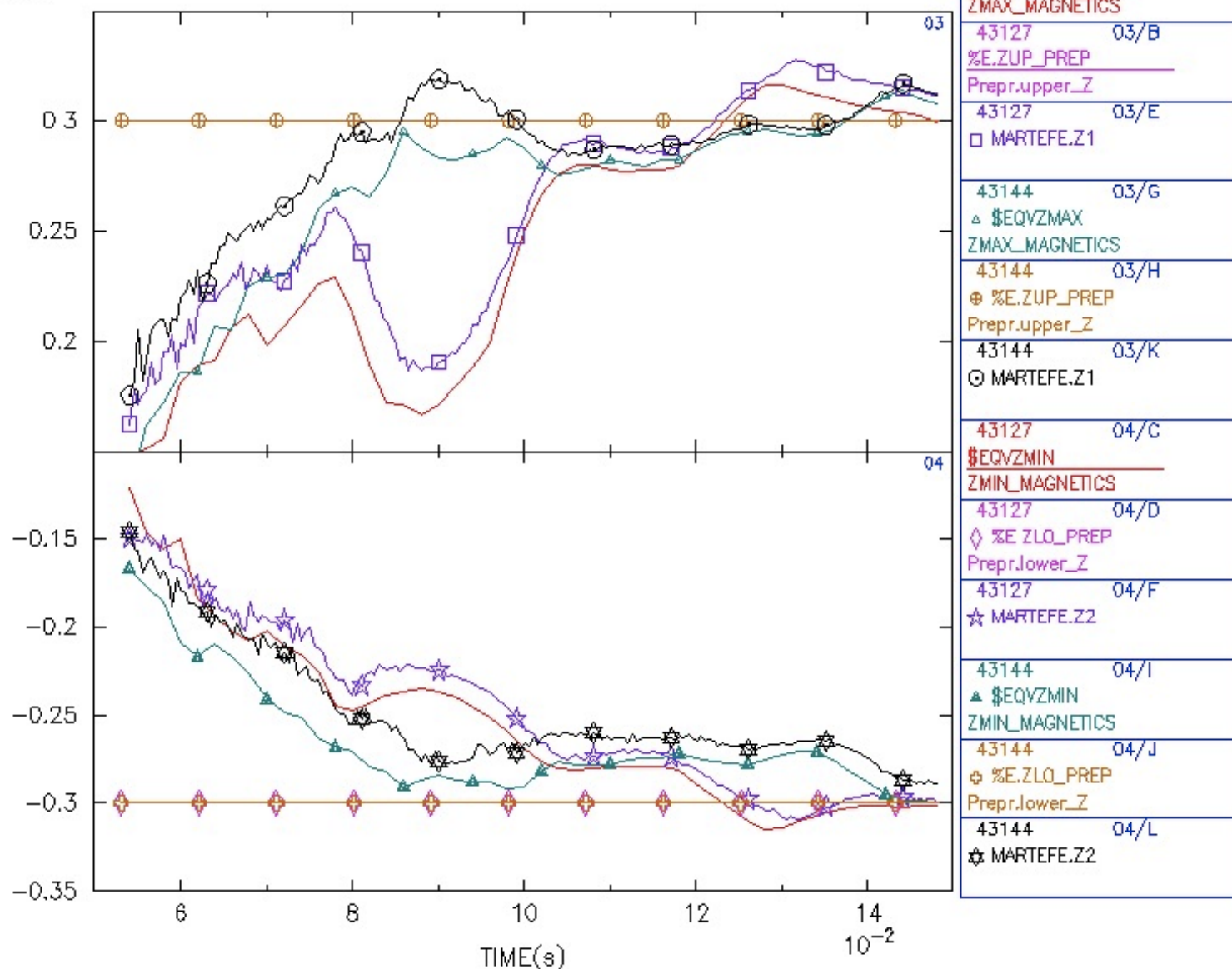


# Shot senza commut => partenza ritardata

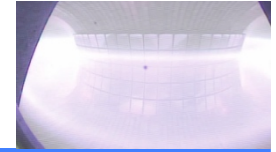
- PID H a zero fino a 130ms (da #43144)



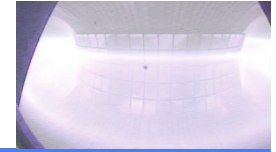
17.10  
4.Jul.19



# Stato della macchina



- Camera si sta sporcando
  - Zeff alti
  - T satura in diverse scariche
- Finestra di prefill
  - Partenze primo shot giornata con prefill tra  $2-8E-6$
  - O.B.:  $2.0E-5$  (martedì 2/7)
  - Durante la settimana si è operato con prefill max di  $1.9E-5$
- Potenza radiata media superiore al 40% e in lenta crescita



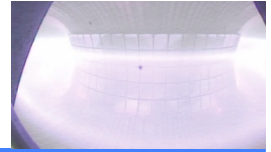
## Week 27:

- Lun. 1/7, test poloidal movement port 8 line 4, ok
- Gio. 4/7, deactivation of plasma protection and shot without plasma, wall cleaning of toroidal limiter

## Week28:

- Most CNR team is not available (EPS week);
- Technical support only available on 11-12/7 for operations with fixed position of mirrors via port 12.

# Week 28



## Restart Lun 8/7

- Ripresa plasma e condizionamento camera
- Completare rampe calibrazione ECE