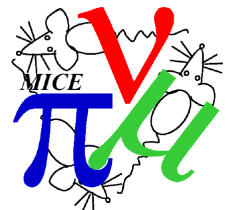


# De-brief / actions on superconducting magnet systems

J Boehm



# 48h soak test for three magnets, SSD, FC, SSU

Start Thursday 22<sup>nd</sup> Sept, 22:00, ramped to 3T setting 6.1.4

Setting	E2	CC	E1	M2	M1	FC	M2	E1	CC	E2	
6.1.1		183.00	206.04	184.02	172.11	99.78	40.61	0.00	208.56	207.11	181.04
6.1.2		183.02	206.00	184.29	166.35	101.91	49.10	0.00	208.23	207.05	181.10
6.1.3		183.14	205.91	183.07	173.04	101.58	59.74	0.00	207.82	206.98	181.19
6.1.4		183.82	205.53	173.66	247.81	99.83	72.00	0.00	205.6	205.6	205.6

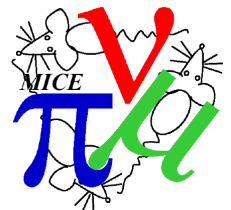
SSU ( T1 @ -31.87A, T2 @ -21.71A)

FC (solenoid)

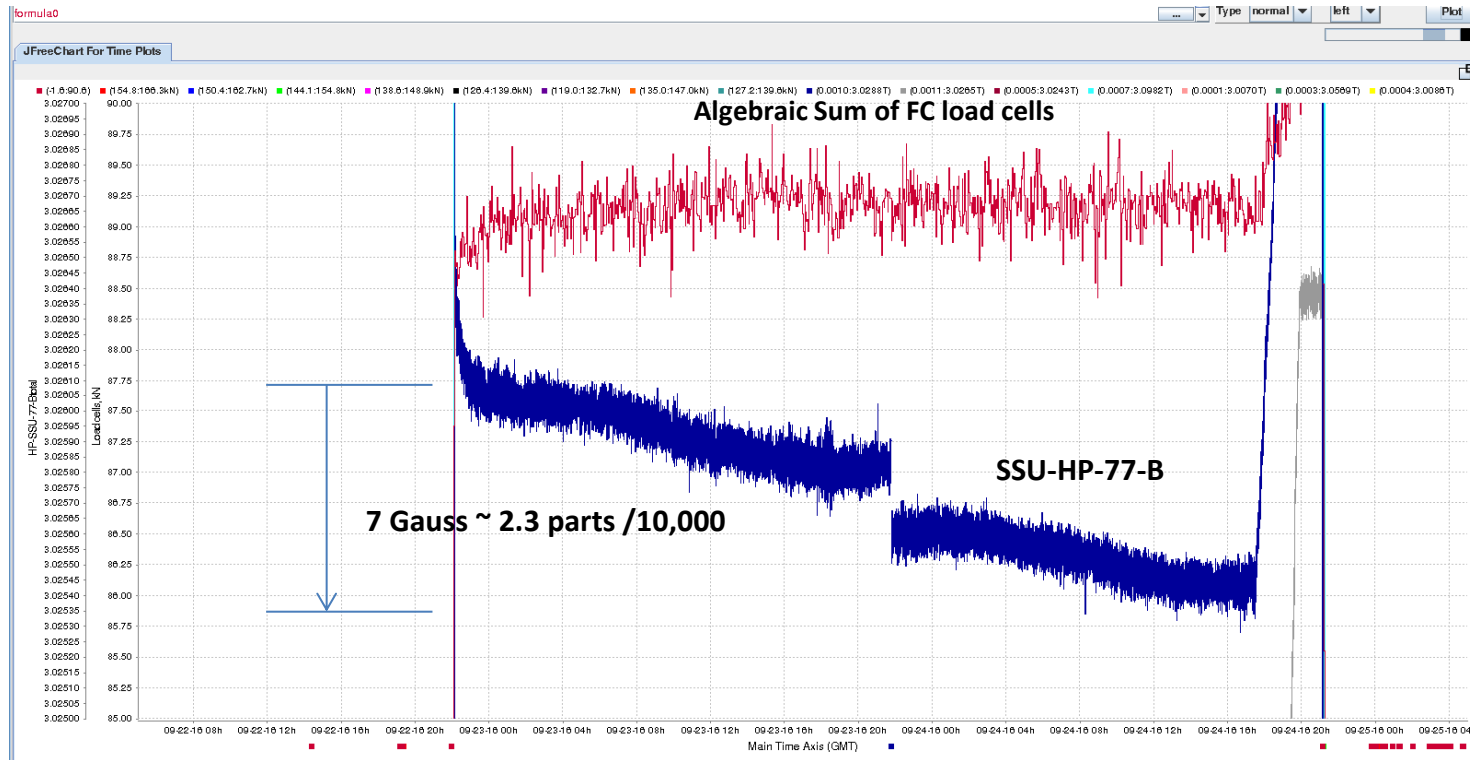
SSD (no trim coils)

## Observations:

- Force between SSU and FC ~ 9t
- This force was slowly increasing, but only by 0.7%
- Cryogenic performance of SSU very healthy, condensing and keeping pressure
- Cryogenic performance of FC very healthy, condensing and keeping pressure
- Cryogenic performance of SSD was borderline, the pressure increased very slowly and the heater percentage was zero. PS: CC2 and CC5 have been increased in pressure today, Tuesday, from 310 to 340psi.



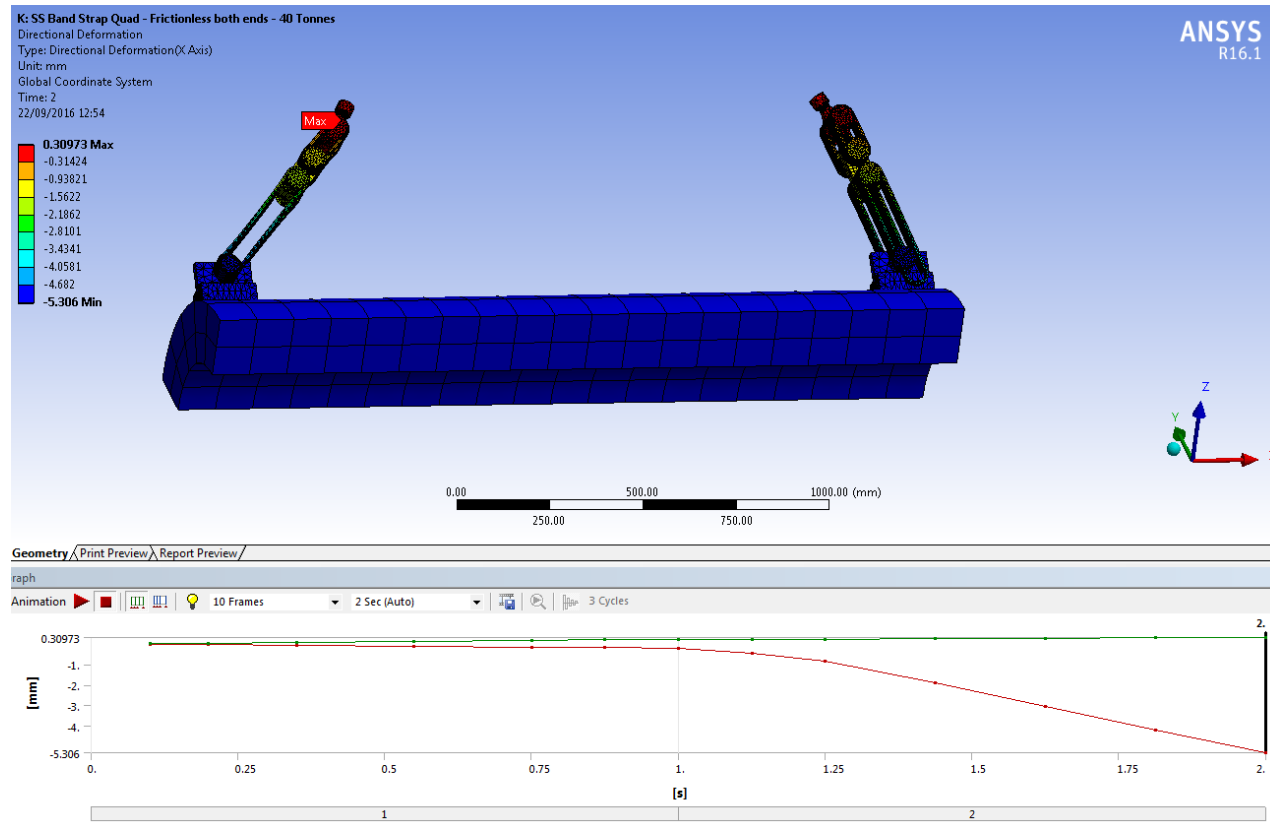
# Instabilities, mechanical and magnetic



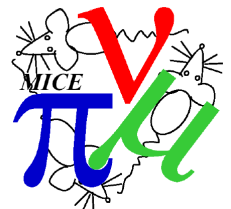
Force appears to increase by  $\sim 0.6 / 89 = 0.7\%$   
Consistent with *decrease* in SSU – FC coil distance of  $\sim 1.6$  mm  
But rather slow (a few hours) – may be other mundane explanations  
(John Cobb)



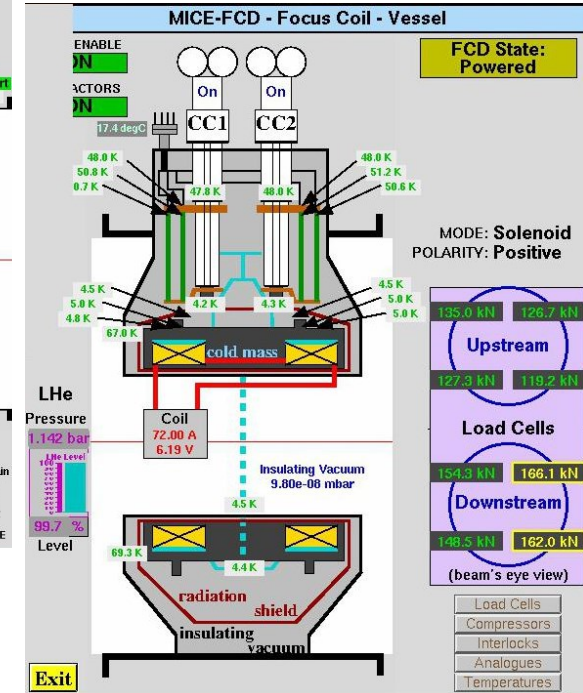
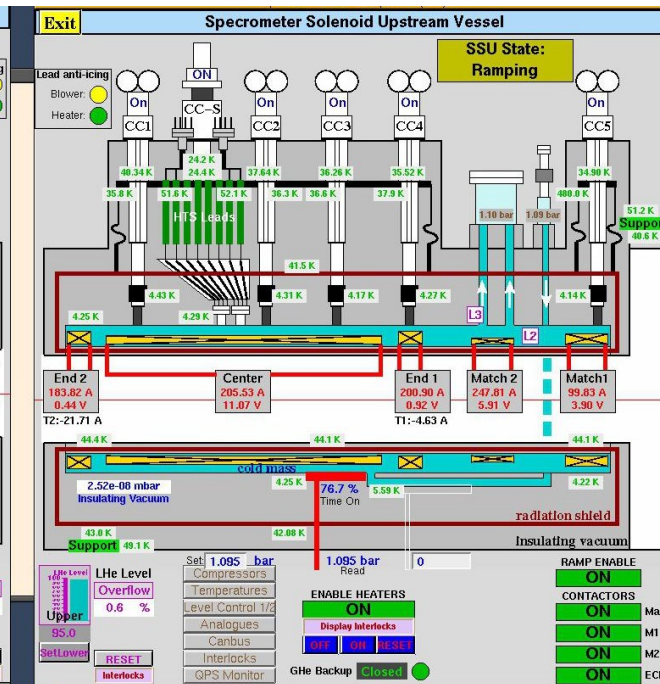
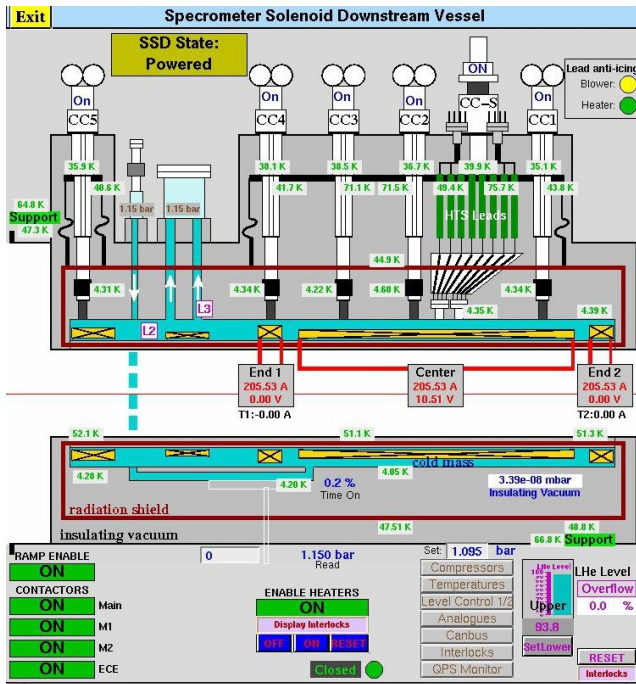
# Movement of cold mass is SSx



- Application of pre-stress and off-balance force of up to 40t → max 4.5mm dislocation
- There will be deformation of the M1 coil to as the ends of the bobbin bend
- It would help if we could ramp M2 to higher currents, and not M1. This would reduce the interaction forces to the FC



# State of magnets Saturday evening, before ramp-down



Cryogenics: good, but slow increase of P in SSD, forces stable

- Reason for ramp-down: T1 had decreased from -31.87A to -4.63A, with associated increase in force and field from E1
- Cause for this current change un-known
- It could have been simply paused and corrected?
- Would it have stopped at zero or would it have risen to positive values?
- Can we operate without the trim PSU's?

