

Focus coils for MICE

Present status

Focus coil 1

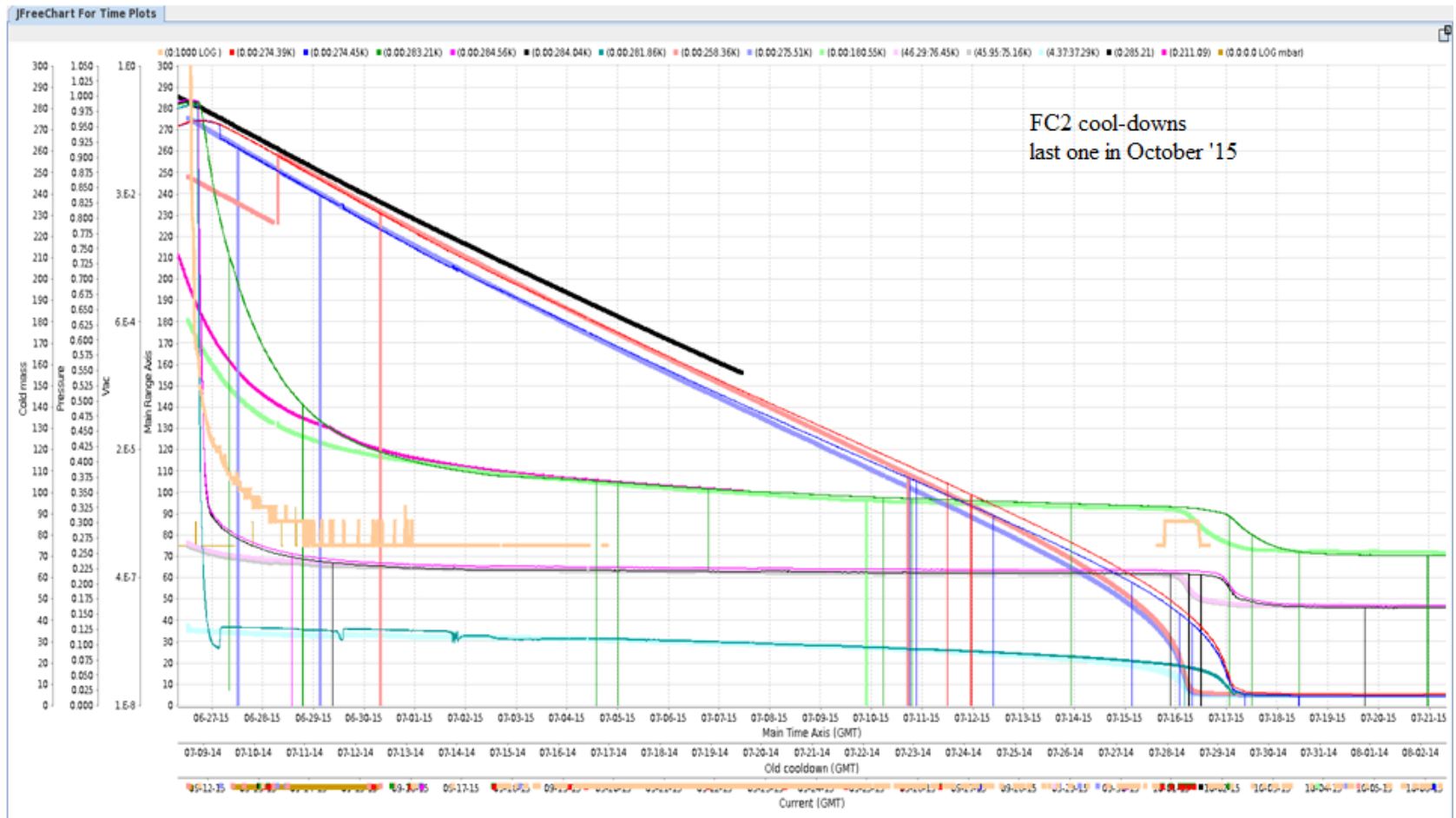
- Had difficulties reaching specified field in the past, numerous training quenches were necessary (13)
- Can be ramped to 187A in flip mode, unstable thereafter
- Has been in beam line as place-holder, empty, coil at room temperature
- Was in beam line with LiH disk inserted, coil at room temperature
- Plan is to cool magnet down from mid April, duration approx 20 days (3 weeks). Indications are that this could be quicker after tightening bolts on pulse tubes (Indium)
- Should be able to be ramped simultaneously with solenoids
- Leaking Fischer socket on magnet side has been shown to be of no consequence: the low diffusion rate is identical with other Fischer sockets (no plan to replace more sockets).

Focus coil 2

- Has been removed from MICE hall in January and is now in R9
- The leaking Fischer socket (Con10) has been replaced and connector flange is now assembled again
- FC2 is now waiting for the absorber cool-down trials, an extra heater is being wired up within H2 turret for this purpose
- Critical now: domed end plate to allow evacuation of bore around absorber for cool-down
- FC2 magnet can be cooled down in R9 for swift switch-over with FC1, once H2 circuit is functional
- FC2 has shown to be capable of reaching full field and remaining in re-condensing state, albeit at elevated helium pressure in cooling loop (at elevated boiling point of liquid helium). The deflections of OVC surfaces can be influenced by pressure. The contact between cold heads and shield has been improved by tightening bolts. The performance of the cold heads has been maximised by increasing the pressure in the compressors.

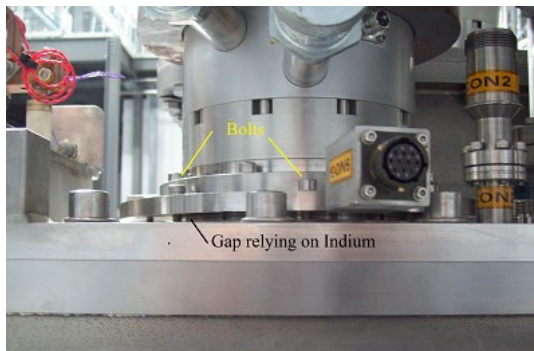
FC2 cool-down behaviour

duration approx 3 weeks



Issues with Focus Coils

- Seat of pulse tubes is not well aligned and interface is Indium → danger of poor thermal contact to radiation shields, slow cool-down, high heat load on second stage (radiation) - solution: check tightness of bolts before each cool-down
- Compressors could fail due to internal gas leaks of compressor: this risk is now reduced after a simple manufacturing error has been identified
- Service of pulse tube on H2 system requires dismantling of beam line
- Biggest uncertainty about focus coils: interaction with spectrometer solenoids



Availability of Focus Coils

- FC1: planned cool-down starting mid April, ready by early May. This magnet is installed in beamline. Anticipated current in flip mode: 187A, in solenoid mode approx 94A
- FC2: is being used as holder for H2 absorber and can be cooled down in R9 if needed. This would shorten the swap-over time into beamline by about 2 weeks. Anticipated current in flip mode: 225A, in solenoid mode: 114A
- Service on cold heads and compressors not within next 12 months, after that a simple adsorber filter exchange