

Summary of Session I (10 talks)

- Thermal modelling of MQXF with OpenFOAM
 - Superfluid He code is validated but combination with solid part is in progress and experimental data has become available
- Modelling of transient dynamics in a boiling He natural circulation loop
 - Natural convection can be described by model needing only minor correction; attenuation of inlet effects is still missing
- Dynamic simulation of tokamak (JT-60SA) cryogenic system comparison to data from HELIOS
 - Agreement between simulation and data (1/20 down-scale)
 - Design of 1/20 scaled commissioning apparatus was explained to validate the commissioning strategy for the JT60SA power plant. What's about off-functional specs?
- Physics-based simplified model for ITER-CS cooling loops
 - Good level of approximation for parametric study
 - Rational approach to come to a fast solver for control optimization
 - Reaction time/inertia of some external components (HX) may not taken into account
- Process Control Strategy for ITER CS Operation
 - Shows a way to absorb the transients with the cold compressors but strongly advices to mitigate the adaptability of operation range to other equipment (pump)

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- Modelization of thermal coupling between ITER TF conductor and structure cooling circuit
 - Model TF conductor+RP+Insulation+Cooling pipe+Casing: Effective thermal coupling between cooling pipe and structure measured in HELIOS, much lower than expected
 - Expectation not detailed enough. Could measurement on individual components and interfaces help to identify the problem?
- Quench analysis of ITER side CC
 - Within a few seconds the change in mass flow can be used as secondary QD system but its at the limit (slow). What's about using pressure shock wave (much faster)? Apparently not in the model
- Modelling KSTAR PF system
 - Very Interesting is the possible pressure compensation to the code
- Thermo-hydraulic analyses of CEA TF-conductor for DEMO
 - In the absence of cooling channels for the coil casing this is not detrimental to the Tcs. However this is on the assumption of a very low current cycling rate. It follows the specs but may be questionable for the long run.
- 1-D analyses of prototype leads for ITER CC
 - Steady state analysis agrees well with experimental data; heat transfer and pressure coefficients can be used for predictions
 - Problems with transient analysis needs further investigations