Contribution ID: **5** Type: **not specified**

# Improved hydraulic model of cryogenic circuits for fusion magnet application

*Monday 11 December 2017 10:00 (30 minutes)*

On the purpose to upgrade the code package of SUPERMAGNET-based hydraulic model, coupled 1-d flows at the multifunction branch is carefully explored not only in the context of hyperbolic PDEs, but also about the numerical stability in coupled solver models of co-simulation method. Comparing with the conventional method in other competitive tools like the ThermoPower package with Openmodelica, a minimalist implementation of momentum-carrying nodal element is introduced with respect to the accuracy issue in the mixing volume under pressurization and momentum transfer. As a remedy for the instability of such a physically-tight flow, an inventive boundary scheme is followed for the new element by means of characteristic decomposition in virtue of the well-known approach for hyperbolic systems. Discussing the stability issue of example models, conformity of the hydraulic systems to the general numerical framework is also investigated as an attempt to improve the coupled solver system of extensive hydraulic modeling using the SUPERMAGNET code package.

**Primary author:** Dr OH, DONGKEUN (National Fusion Research Institute)

**Presenter:** Dr OH, DONGKEUN (National Fusion Research Institute)

**Session Classification:** Session III