**Coarse Grid CFD for underresolved simulation**[1] ANDREAS G. CLASS, MATHIAS O. VIELLIEBER, STEFFEN R. HIMMEL[2], Karlsruhe Institute of Technology — CFD simulation of the complete reactor core of a nuclear power plant requires exceedingly huge computational resources so that this crude power approach has not been pursued yet. The traditional approach is 1D sub-channel analysis employing calibrated transport models. *Coarse grid CFD* is an attractive alternative technique based on strongly under-resolved CFD and the inviscid Euler equations. Obviously, using inviscid equations and coarse grids does not resolve all the physics requiring additional volumetric source terms modelling viscosity and other sub-grid effects. The source terms are implemented via correlations derived from fully resolved representative simulations which can be tabulated or computed on the fly. The technique is demonstrated for a Carnot diffusor and a wire-wrap fuel assembly [1].

[1] Himmel, S.R. phd thesis, Stuttgart University, Germany 2009, http://bibliothek.fzk.de/zb/berichte/FZKA7468.pdf

[2]Currently Siemens AG

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