Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

The CONV-3D code for DNS CFD calculation VLADIMIR CHUDANOV, The Nuclear Safety Institute of the Russian Academy of Sciences, ALCF THERMHYDRAX TEAM[1] — The CONV-3D code for DNS CFD calculation of thermal and hydrodynamics on Fast Reactor with use of supercomputers is developed. This code is highly effective in a scalability at the high performance computers such as "Chebyshev", "Lomonosov" (Moscow State University, Russia), Blue Gene/Q(ALCF MIRA, ANL). The scalability is reached up to 10^6 processors [1]. The code was validated on a series of the well known tests in a wide range of Rayleigh (10^6-10^{16}) and Reynolds (10^3-10^5. Such code was validated on the blind tests OECD/NEA of the turbulent intermixing in horizontal subchannels of the fuel assembly at normal pressure and temperature (Matis-H), of the flows in T-junction and the report IBRAE/ANL was published [2]. The good coincidence of numerical predictions with experimental data was reached, that specifies applicability of the developed approach for a prediction of thermal and hydrodynamics in a boundary layer at small Prandtl that is characteristic of the liquid metal reactors.

[1] V.V. Chudanov et al. The national supercomputer forum (NSCF-2013). Pereslavl-Zalesskii, 26-29 November, 2013.
[2] A.V. Obabko, P.F. Fischer, et al. ISBN 978-953-51-0987-7, Published: February 13, 2013 under CC BY 3.0 license. DOI: 10.5772/53143. 2013.

[1]Project Name: ThermHydraX. Project Title: U.S.-Russia Collaboration on Cross-Verification and Validation in Thermal Hydraulics

Vladimir Chudanov
The Nuclear Safety Institute of the Russian Academy of Sciences

Date submitted: 09 Dec 2013   Electronic form version 1.4