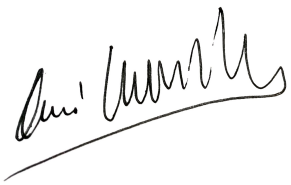
Barcelona Supercomputing Center
Centro Nacional de Supercomputación

Barcelona, August 8th, 2017

Subject: Internship – Arjun Ajay

Arjun Ajay has completed the internship at Barcelona Supercomputing Center under my supervision starting on 2nd April, 2017 and ending on 31st July, 2017. The internship topic was on Fractional Step methods for Incompressible Navier Stokes Flow. He started with the literature review of the state of the art Fractional Step methods. An overview of the Pressure correction methods – Standard, Incremental and Rotational Pressure correction methods, and Velocity correction methods was presented by him. Then, he verified the Implementation of the Explicit first and second order Adam Bashforth methods in Alya – A High performance Computational Mechanics Simulation Code, developed at BSC, using the Method of Manufactured Solution (MMS). He then went on to analyze the rotational form of the Fractional step implementation. He ran the cases of Cavity flow in 2D and 3D, and flow around a cylinder. It was seen that rotational form did not provide any substantial reduction in the L2 norm of the pressure error compared to the standard form as was theoretically predicted.



Oriol Lehmkuhl, Phd
Dpt. Computer Applications in Science and Engineering
Barcelona Supercomputing Center (BSC-CNS)
Edificio NEXUS II, 3rd Floor
Gran Capitan 2-4
08034 Barcelona, Spain
Tel: +34 93 405 4289
Fax: +34 93 413 7721
www: www.bsc.es