Contribution ID: **3** Type: **Poster Presentation**

Numerical Study of Microfluidic Transitional Flow Regime Curvature Effects for Compressible Isothermal Gases using Generalized Slip Boundary Conditions

Monday, 11 July 2016 16:30 (1 hour)

Abstract content
   (Max 300 words)
Formatting &
Special chars

In this paper we develop a numerical implementation of a generalized second order boundary condition reported by Guo et al [Physical Review E Vol. 89, 013021 (2014), DOI: 10.1103/PhysRevE.89.013021] for non-equilibrium gas flows and utilize the implementation to investigate microfluidic transitional flow regime curvature effects. The generalized boundary conditions expressed in terms of a nonlinear velocity slip with a wall function are incorporated into a modified nonlinear finite volume discretization incorporating generalized finite differences for the boundary conditions which we develop for an extended Navier-Stokes system of equations. Utilizing the developed computational scheme we then study the influence of transitional flow regime curvature effects in a gas piston-cylinder pressure balance interface gap and report on the observed microfluidic characteristics and behaviour.

Primary author: Mr RAMNATH, Vishal (University of South Africa)

Presenter: Mr RAMNATH, Vishal (University of South Africa)

Session Classification: Poster Session

Track Classification: Fluid Dynamics