

## **A simple model of heat distribution at various Rayleigh number in silicon elastomer**

S. Samal<sup>1\*</sup>, I. Blanco<sup>2</sup>, G. Crescente<sup>3</sup>, M. Catauro<sup>4</sup>

<sup>1</sup> FZU-Institute of Physics of Czech Academy of Science, Na Slovance 1999/2, 182 21 Prague 8, Czech Republic

<sup>2</sup> Department of Civil Engineering and Architecture and UdR-Catania Consorzio INSTM, University of Catania, 6 Viale Andrea Doria, 95125 Catania, Italy

<sup>3</sup> Department of Environmental, Biological and Pharmaceutical Sciences and Technologies; University of Campania "Luigi Vanvitelli", Via Vivaldi 43, 81100 Caserta, Italy

<sup>4</sup> Department of Engineering, University of Campania "Luigi Vanvitelli", Via Roma 29, I-813031 Aversa, Italy;

\*corresponding author :samal@fzu.cz

**Keywords.** Polymer, Silicon rubber, Prandtl number, Rayleigh number, Heat distribution,

### **Abstract**

In order to investigate the two dimensional flow of a non-Newtonian fluid, such as elastomer liquid over a cylinder, a simplified model was carried out. The analysis was carried out to study the thermo-physical properties of the melt elastomer flow with Prandtl variable in the presence of internal heat generation. The temperature dependent physical properties such as velocity, contour temperature, surface temperature as a function of contour velocity and contour pressure were considered and discussed. Moreover, the exchange of energy from the surface to the fluids was examined through variation in the Rayleigh number.