1128-35-329 **Lyudmyla L. Barannyk*** (barannyk@uidaho.edu), 875 Perimeter Drive MS 1103, Brink Hall 317, Moscow, ID 83844-1103, and **John C. Crepeau** (crepeau@uidaho.edu), 875 Perimeter Drive MS 0902, Moscow, ID 83844-0902. *On the Stefan problem with internal heat generation in a cylinder.* Preliminary report.

We consider a problem of solid-liquid phase change driven by internal heat generation of the material in cylindrical coordinates. We incorporate the following assumptions: (1) the internal heat generation and the thermophysical properties of the materials are equal and constant in both the solid and liquid phases; (2) the material changes phase at only a single temperature; (3) there is no convection in the liquid phase; (4) we neglect the formation of the mushy zone so that there is a single, distinct interface $s(t)$ between the phases; finally, (5) there is no temperature variation circumferentially in the cylinder. Formulating problems for solid and liquid phases, which are non-homogeneous partial differential equations, we use the method of superposition to obtain steady-state and transient equations, which are then solved by the method of separation of variables. We show that the evolution of the phase change front $s(t)$ is governed by an ordinary differential equation. We solve the resulting equation numerically and compare solutions with the computational fluid dynamics (CFD) solutions. The relations between the interface, time and heat generation are analyzed. (Received February 28, 2017)