



Graduate Physics Seminar
9 June 2014 from 16:00
University of Nova Gorica - Ajdovščina Campus
Vipavska 11, Ajdovščina
Amphitheatre

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Modeling of thermo-mechanical phenomena during DC casting of Aluminum alloys: a meshless approach

Abstract

The ability to model thermo-mechanics in DC casting is important due to the technological challenges caused by this physical phenomenon. Firstly, due to the thermal contraction of the solidified billet the dimensions change. This can cause changes in boundary conditions for the heat transfer that can lead to remelting or even melt bleed-out. Secondly, the large stresses caused by the thermal contraction can cause plastic deformation of the billet which results in hot tearing, cold cracking and unwanted residual stress. In the seminar the technological challenges will be presented along with a thermo-mechanics model using a novel meshless method. Some preliminary studies of mechanical stress field in an industrially relevant DC casting setting will be presented.