

SOLIDIFICATION PROCESS IN A BENCHMARK EXPERIMENT

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Abstract: The introduction of magnetic field in the solidification process is one of the effective methods to improve the microstructure and mechanical performance of alloys (by controlling the defects as freckles or segregated channels). At SIMaP-EPM laboratory, we have proposed to control the fluid flow with a travelling magnetic field (TMF). With this kind of electromagnetic field the control of the intensity and the direction of Lorentz force are easy (by changing the order of electric phases). Since ten years, EPM team developed some experiments and models around the TMF. The present work deals with a experimental and numerical studies of solidification process under forced convection induced by a travelling magnetic field (TMF). The impact of TMF and gravity on segregations of a Tin-Lead alloy has been examined.