

Estimation for heat transfer coefficient of secondary cooling process during slab continuous casting

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Abstract: Accurate description of heat transfer and reasonable control of secondary cooling process are the basic requirements for high efficient continuous casting. To optimize the cooling process and temperature behavior of continuous casting slab, a novel method was presented to predict the heat transfer behavior in secondary cooling process. The PSO algorithm merged with heat transfer calculation model is implemented to optimize the heat transfer coefficients of the secondary cooling zone from the knowledge of temperature measurements obtained on the slab surface. Through verifying the validity and efficiency of the integrated method proposed, the temperature variation of slab surface is more coincident with measured temperatures along the casting direction. The calculation results confirm that the heat transfer coefficient could be estimated precisely with measurement temperatures using PSO algorithm. Application of this algorithm may be used to solve other similar inverse problems, and it is also expected that the prediction accuracy of the proposed model will be further improved when more data are available in the future work.

KEY WORDS: secondary cooling, heat transfer, particle swarm optimization, continuous casting

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