Adaptive support vector machine-based surface qualityevaluation and temperature monitoring. Applicationto billet continuous casting process

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Abstract: A method for surface quality evaluation and tem-perature monitoring of the billet in continuous casting isconsidered in this paper. This method uses the differencebetween the measured and the filtered temperature comput-ed using an adaptive support vector machine method. Thetemperature field, measured by an infrared camera, is affect-ed by an important noise called calamine (a metal oxidegenerated during the cooling process). The quality of thebillet's surface temperature is connected to the secondarycooling behavior, and therefore an evaluation of the cala-mine effect is needed. Methods such as soft sensing andadaptive support vector machine are used for a global eval-uation of calamine intensity on the monitored area of thebillet in continuous casting. This kind of approaches isapplied in continuous casting process for constructing acomplementary condition monitoring system, which allowsan online calamine evaluation. Simulation results, based onthe measured surface temperature and the adaptive supportvector machine analysis, showed that this new combinedapproach is easily implementable and gives good resultswhen applied online.