

# Adaptive support vector machine-based surface quality evaluation and temperature monitoring. Application to billet continuous casting process

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**Abstract:** A method for surface quality evaluation and temperature monitoring of the billet in continuous casting is considered in this paper. This method uses the difference between the measured and the filtered temperature computed using an adaptive support vector machine method. The temperature field, measured by an infrared camera, is affected by an important noise called calamine (a metal oxide generated during the cooling process). The quality of the billet's surface temperature is connected to the secondary cooling behavior, and therefore an evaluation of the calamine effect is needed. Methods such as soft sensing and adaptive support vector machine are used for a global evaluation of calamine intensity on the monitored area of the billet in continuous casting. This kind of approach is applied in continuous casting process for constructing a complementary condition monitoring system, which allows an online calamine evaluation. Simulation results, based on the measured surface temperature and the adaptive support vector machine analysis, showed that this new combined approach is easily implementable and gives good results when applied online.

**Keywords :** Continuous casting . Surface billet casting . Infrared temperature measurement . Adaptive support vector machine (ASVM) . Process and quality evaluation