Visual Inspection of a Combustion Process in a Thermoelectric Plant

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ABSTRACT

Infrared images provide useful information to inspect the status of combustion processes. The flame geometry and intensity depend on the process variables and the characteristics of the combustion chamber. This paper describes methods to analyze infrared images of industrial flames and to characterize the flame geometry. A segmentation algorithm is proposed to separate the flame region from the background using an image formation model, a background model and the available shape information. The flame is characterized by a pair of contours (an inner contour and an external contour) which are evaluated by Bayesian estimation methods. A set of parameters computed from the segmented image is defined to characterize the flame geometry. Finally, the proposed algorithm is used to study the relationship between the flame parameters and the process variables in a boiler of a thermoelectric plant.

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