



## Development on Flame Stability Diagnosis for Pulverized Biomass Burner via image processing

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**Abstract.** Recently, most of published works has put activity on applying image processing with burner operating condition due to low cost on data collection. In this work, the algorithm based on video image processing on pulverized biomass flame has been proposed aiming to create burner control system with image base. Unlike any other works, the image of flame together with unburned particle density was converted to binary image and determined relying on three threshold methods. By conducting experiment with different thermal throughput, 250 and 300kWth, on pulverized biomass burner, series of images were obtained based on stable condition to distinguish the flame pattern. Results suggested that the threshold was an important parameter on flame image analysis. Adaptive threshold known as Otsu's method could give binary images in good agreement with observed flame pattern. However, when flame extinction occurred, the furnace wall was wrongly detected as being a flame zone due to heat accumulation on refractory bricks. This pointed out that the adaptive threshold needs further improvement to optimize with our particular flame characteristic with strong illumination of furnace background.

Keywords: Flame stability, Flame diagnosis, Pulverized biomass, burner