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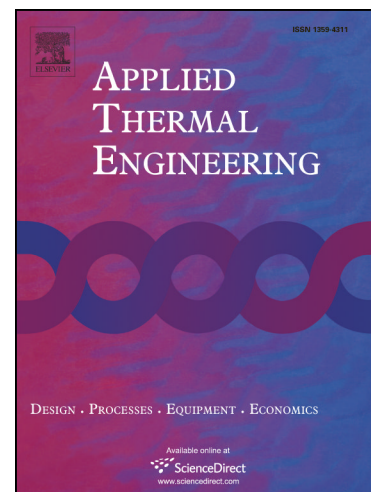
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Simulation of calibration process in flame measurement by plenoptic camera

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Running Title: **Flame simulation using plenoptic camera**

Abstract: With the rise in research on the high-temperature reconstruction of flame, numerical simulation and experimental research on flame detection using plenoptic camera have become more numerous. This study simulates the calibration process of the plenoptic camera to understand the light field imaging process of flame. Based on the simulation platform using the Monte Carlo method, different temperatures generated by the blackbody planes are calibrated, and the relationship between the radiation of the spectral blackbody and the gray value of the detector is obtained. In addition, the effects of refocusing on the temperature reconstruction of the blackbody plane light field imaging at different positions are analyzed. Simulation results show that, by comparing with the experimental results, the simulated flame is found to be almost the same in scale and shape. The result of the temperature reconstruction of the simulated flame is accurate enough to prove that, the numerical simulation of the calibration can improve the confidence of the detector conversion step. Thus, this paper provides a relatively complete simulation platform to obtain and analyze the uncertainty in each step in the process of flame temperature measurement in a light field.

Keywords: radiative heat transfer; flame measurement; light field imaging; blackbody calibration

1. Introduction

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