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THERMAL SCIENCE

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COMPARISON OF VELOCITY MEASUREMENTS BY HIGH TEMPERATURE ANEMOMETER AND LASER-DOPPLER ANEMOMETER WITH RESULTS OF CFD-SIMULATION

ABSTRACT

In the present work, results of gas velocity measurements with a newly developed vane anemometer (HTA - High-Temperature-Anemometer) are compared with results of measurements obtained from Laser Doppler Anemometer (LDA). The measurements were carried out at the combustion test rig of ALSTOM Combustion Services Ltd. in Derby/UK, and demonstrate the usability and accuracy of the High-Temperature-Anemometer under severe conditions. The test rig was provided with a triple register low NO_x coal burner firing pulverised Colombian blended coal at a constant thermal load of 30 MW. Although the environment was both very hot (up to 1350°C) and dust laden, the vane anemometer worked with an accuracy comparable to the reference LDA measurement. Since the anemometer represents a relatively simple to use and low cost option compared with LDA, it is seen as a viable alternative for gas velocity measurements in difficult environments. The measurement results are also demonstrated to compare favourably with the results from CFD calculations of the flow in the combustion chamber of the test rig.

KEYWORDS

[velocity measurement](#), [HTA](#), [LDA](#)

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