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DEVELOPMENT OF A LDV PROBE FOR VELOCITY MEASUREMENTS IN A 600MW PULVERIZED COAL POWER PLANT

by

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ABSTRACT

A complete understanding of the phenomena involved in combustion processes is necessary in order to select the more appropriate physical models for designing and optimizing advanced industrial combustion systems. These models are integrated into numerical calculations for the prediction of the combustion efficiency enhancement and the pollutant emission reduction, particularly for NO_x and SO_x. To validate such a tridimensional (3D) numerical code, an experimental program was conducted in order to characterize the aerothermochemistry of the flow in a 600MWe pulverized coal (PC) power plant. A Laser Doppler Velocimetry (LDV) probe was specially designed and adapted to measurements of the three velocity components in a large scale industrial situation. Preliminary tests were performed at the laboratory to evaluate and optimize the validity of the optical diagnostic technique. Then, the aerodynamic field of the flow was determined in the full scale PC burner flame. The data processing shows the validity and the applicability of the optical LDV technique to provide information on the coal combustion behavior. The available data can be used to validate three dimensional numerical results.