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## LES and RANS of pulverized coal oxy-combustion in swirl burners

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Combustion of pulverized coal in oxy-combustion technology is one of the effective ways to reduce the emission of greenhouse gases into the atmosphere. The process of transition from conventional combustion in air to the oxy-combustion technology, however, requires investigations of the phenomena occurring during the combustion process that can be greatly supported by numerical modelling. The paper presents the results of numerical simulations of pulverized coal combustion process in swirl burners using RANS and LES methods for turbulent flow. Most of the numerical simulations of pulverized coal oxy-combustion process have been done using RANS method and only a few articles show the results for LES. Therefore authors took an attempt to analyze the influence of turbulence model on the results of pulverized coal oxy-combustion technology. Numerical analyzes of the oxy-combustion process have been performed using RANS and LES methods in two test facilities with swirl burners. The numerical simulations were performed using RANS and LES approaches for combustion in air and in  $O_2/CO_2$  atmospheres. The test cases analyzed show clearly that proper modelling of underlying turbulent flow is crucial for quality of combustion process predictions.

## Biography

A Boguslawski has completed his PhD in 1991 year from Czestochowa University of Technology (Poland) and Postdoctoral studies from LEMD-CNRS in Grenoble (France). In 2002, he received DSc degree from Czestochowa University of Technology. In years 2005-2012 he was the Director of the Institute of Thermal Machinery at Czestochowa University of Technology. He has published more than 70 papers in reputed journals and international conferences proceedings. His research is focused on turbulence modelling, turbulent combustion and shear flow stability. He coordinated many national research projects and participated in international European Framework Programs research projects.

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