

**STUDY OF A TURBULENT NITROGEN-DILUTED HYDROGEN-AIR DIFFUSION  
FLAME THROUGH LARGE-EDDY SIMULATIONS COUPLED WITH A FIRST ORDER  
CONDITIONAL MOMENT CLOSURE METHOD**

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**ABSTRACT** this work concerns numerical simulations of a hydrogen diffusion flame, using Large Eddy Simulations (LES) and Conditional Moment Closure (CMC) as turbulent combustion model. In order to explore the effect of turbulence, two types of inlet boundary conditions are applied: Random Noise and a method of Random Spots. The analysis of Favre-averaged profiles of velocity, mixture fraction, temperature and species has led to the conclusion that the method of Random Spots is in much better agreement with the experimental data, as expected. However, several discrepancies between simulations and experiments can also be caused by the boundary conditions applied at the sides and the outlet of the domain.