OPTIMIZED NET EXCHANGE MONTE CARLO SIMULATION OF FLAMES RADIATION

P. PEREZ*, A. de LATAILLADE, M. EL HAFI*, R. FOURNIER**

* École des Mines d'Albi Carmaux
Campus Jarlard, route de Teillet, Albi, France
** Laboratoire d'Études des Systèmes et Environnement Thermique de l'Homme
U. Paul Sabatier, Route de Narbonne, Toulouse, France

ABSTRACT. The aim of this paper is to present new mathematical developments to modeling radiation in flames. A Monte Carlo Method based on a Net Exchange Formulation is used to calculate the radiative source term. The advantage of this method is that, still providing reference solutions, the net exchange formulation together with a choice of adapted probability density functions allows one to significantly decrease the number of random generations while keeping small standard deviations. Some 1-D and 2-D code validation test cases are presented in this paper as a step toward application of this new approach to complex geometries.