NON-GRAY GAS MODELING IN COMPLEX ENCLOSURES: APPLICATION OF THE HYBRID SNB-CK METHOD

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ABSTRACT. This study compares the relative efficiencies (accuracy and computation time) of three versions of the hybrid CK/statistical narrow band method (SNB-CK) for characterizing radiative exchanges in enclosures containing a mixture of non-gray gases (CO_2 and H_2O). One of these versions, which is characterized by a selective regrouping of bands, leads to very good results while the computation time is significantly decreased with respect to the original SNB-CK version. Complex 2D cases, close to real combustion chambers, are analysed. These cases include irregular geometry and non-uniform concentration and temperature fields. The radiative transfer equation is solved by the discrete ordinates method. The importance of the presence of CO as a third component is also assessed.