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ACCURACY OF ENGINEERING METHODS FOR RADIATIVE TRANSFER IN CO2-H2O MIXTURES AT HIGH TEMPERATURE

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ABSTRACT. The aim of the paper is to evaluate a set of recently proposed engineering methods of gas radiation. For this purpose, a 3D stochastic ray tracing code was developed to treat realistic geometries. Model parameters based on the same LBL dataset were constructed for all approximate methods. Comparisons consist of two steps: 1/ a set of rays randomly spread over the unit sphere is chosen and narrow band models are assessed against LBL calculations. The most accurate narrow band method is chosen as the reference, 2/ all models are then compared with the chosen reference. For the cases considered in this paper, it was found that: 1/ the *l*-distribution approach is more accurate than C*k* methods and can be used as the reference; 2/ the RC-SLW model provides very accurate predictions; 3/ the WSGG technique, which is the fastest method considered in this work, provides acceptable estimations, even in highly non-isothermal situations.