

The Rank Correlated SLW Model of Gas Radiation in Non-Uniform Media

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ABSTRACT A comprehensive theoretical development of possible reference approaches in modelling of radiation transfer in non-uniform gaseous media with the help of the Generalized SLW Model is presented. It is shown that eight different reference approaches are possible, of which only three have been reported in the literature. Among the approaches presented is a new version (termed Method I.2.2) which is distinguished by the fact that it does not require the specification of a reference gas thermodynamic state, and it preserves the emission term in the spectrally integrated Radiative Transfer Equation. Construction of this reference model requires only two ALBDFs, and subdivision into gray gases can be performed using standard quadratures. Consequently, this new reference approach appears to have significant advantages over all other methods. All reference approaches are summarized in this work, and results of their use in predictions are presented for simple example cases.