

**CALCULATIONS OF RADIATIVE HEAT TRANSFER IN AN AXISYMMETRIC JET
DIFFUSION FLAME AT ELEVATED PRESSURES USING DIFFERENT METHODS**

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ABSTRACT. Radiation heat transfer in axisymmetric jet diffusion flames under conditions relevant to oxygen-enriched combustion at total pressures of 1 and 30 atm was calculated using several gas radiation models: line-by-line, narrow-band correlated-k, wide-band correlated-k, full-spectrum correlated-k, and weight-sum-of-grey-gases. An optimized full-spectrum correlated-k, an optimized narrow-band correlated-k, and a wide-band correlated-k model were proposed and evaluated. Line-by-line results are used as the benchmark solution in the evaluation of other gas radiation models. The optimized full-spectrum correlated-k model was found to improve significantly the computational efficiency to a level comparable to that of the weight-sum-of-gray-gases model without significant loss of accuracy.