

ON SIMULATIONS OF RADIATIVE HEAT TRANSFER IN COMBUSTION APPLICATIONS

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ABSTRACT In the design of boiler furnaces and gas turbine combustors it is desirable to enable prediction of the radiative heat transfer with high accuracy so that the heat loads on the walls can be properly estimated. In such applications commonly participating media like various gases and particles, e.g., soot, need to be taken into account. Then in addition to the common governing equations for conservation of mass, momentum and energy, the so-called radiative transfer equation (RTE) needs to be considered and accordingly the radiative properties of gases and particles must be taken into account. This keynote lecture focuses on how to improve the accuracy of the heat load calculations for the combustor walls and discusses various methods to solve the radiative transfer equation. In addition, methods to determine the absorption coefficients of various gases and the scattering coefficients of particles are presented. Illustrative examples are used to highlight the messages of the lecture.

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