RADIATIVE TRANSFER IN PARTICIPATING, ISOTROPICALLY SCATTERING, INHOMOGENEOUS THREE DIMENSIONAL RECTANGULAR ENCLOURES

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ABSTRACT. The effects of inhomogeneous participating medium on the radiative transfer in three dimensional rectangular enclosures are investigated using the standard discrete ordinates method (DOM). The DOM S_{16} solutions for three rectangular geometries were obtained for space dependent linear and quadratic scattering albedos. The problem considered is a three dimensional rectangular cold enclosure which is subject to externally isotropic unit incidence of radiation at the top surface. The incident energy and outgoing heat flux profiles from the top and side locations are comparatively examined. Space-dependent scattering albedo influences the incident energy and outgoing heat flux in the vicinity of the source wall. For increasing optical dimensions, both quantities decrease near the cold walls.

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