DISCRETE ORDINATES SOLUTION OF RADIATIVE TRANSFER ACROSS A SLAB WITH VARIABLE REFRACTIVE INDEX

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ABSTRACT. The radiative transfer equation (RTE) is derived in both conservative and non conservative forms for a plane slab made of an absorbing-emitting material with a continuous transverse variation of refractive index. The RTE is set in a form which displays an angular redistribution term analogous to what is appear in curvilinear media with uniform index. Numerical solutions are provided by means of the discrete ordinates method. Results are given for a slab bounded by diffuse surfaces and submitted on each exterior side to a black body radiation at prescribed temperature. Comparisons are made with previously published predictions either on a similar problem but with a different solution technique (ray-tracing) or on a different model (composite medium with diffuse sublayers).