

An Exposition of the Discrete Ordinates Method for Complex Irregular Geometries Utilizing a Structured Mesh

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The discrete-ordinates-method (DOM) is one of the primary numerical techniques for the solution of the Boltzmann Transport Equation (BTE) as well as other transport equations that have been derived from the BTE. These transport equations are used for the study of various phenomenon such as the radiation heat transfer in a participating media, heat conduction via phonon transport at the micro/nanometre scales, neutron transport theory, etc. DOM has traditionally been used in rectangular coordinates, however, relatively recently, the DOM technique has been fully extended to be applicable in structured, general, orthogonal as well as non-orthogonal coordinate systems. Orthogonal and non-orthogonal coordinate systems can be successfully used to cover complex, irregular geometrical domains with a structured mesh and hence an efficient solution procedure based on the DOM can be developed.

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