A Discontinuous Galerkin Method for the Solution of One Dimensional Radiative Transfer Equation

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The radiative transfer equation (RTE) for a plane-parallel problem involving scattering, absorption and radiation is solved using the discontinuous Galerkin (DG) finite element method (FEM). Both space and angle directions are discretized by the DG method. The problem is formulated for nonzero phase function. The method is validated against exact solutions, and compared with other space-angle and hybrid FEMs for a few benchmark problems. The performance of the method is also studies for the solution of problems with discontinuous solution.