Mixed finite element methods for radiative transport

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The radiative transfer equation (RTE) is a basic model for transport, absorption and scattering of particles, e.g., photons, in dense media. We consider the numerical solution of the RTE via Galerkin discretizations of a mixed variational principle. We prove inf-sup stability conditions on the continuous and discrete level. Two particular discretizations of PN and SN type are presented, and limitations of these approaches, arising from the discrete inf-sup conditions, are highlighted.

[1] H. Egger and M. Schlottbom. A Mixed Variational Framework for the Radiative Transfer Equation. Math. Mod. Meth. Appl. Sci., 2011, accepted.

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