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Title: HPC Discrete Ordinates Method for the solution of 3D radiative transfer.

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Application of high performance computing (HPC) tools for the solution of 3D radiative transfer is the subject of this study. An iterative, Jacobian-free Newton Krylov (JFNK) method is used for the solution of the system of equations that result from application of the discrete ordinates method (DOM). Parallelization of the JFNK solution is introduced in a combined memory-shared/memory-distributed formulation with the aid of threaded methods and the message passing interface (MPI), respectively. An adaptive mesh refinement complements the multidomain decomposition strategy used on memory distributed multinode clusters. Results are presented for the scalability, convergence, acceleration and accuracy as a function of the different parameters involved in JFNK solvers.