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ACCELERATING MULTIDIMENSIONAL NLTE RADIATIVE TRANSFER USING FORTH-AND-BACK IMPLICIT LAMBDA ITERATION

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State-of-the-art methods in multidimensional NLTE radiative transfer are currently based on local approximate lambda operator, and accelerated either by applying Ng acceleration to Jacobi iteration, or by accelerating Gauss-Seidel technique via SOR and SSOR methods. Formal solution is almost exclusively based on the short characteristics approach. Here we offer another type of acceleration, based on FBILI approach developed for 1D NLTE radiative transfer problems. In the formal solution of the RT equation we use two-point algorithm, i.e. we take into account the values of source function and its derivative at local and upwind points only. We introduce an implicit representation of the source function in the computation of the intensities by computing and storing the coefficients of the linear relations $J = a + bS$ in all directions. Here the coefficient b is similar to the local operator used in other approaches. The coefficients of the linear relations are then used to update the values of the source function to be exploited as soon as they are available in a process similar to Gauss-Seidel method. Further acceleration is achieved by introducing iteration factors in the coefficient b. The preliminary results show substantial acceleration as compared to the above mentioned techniques.