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SCATTERING LINE POLARIZATION FROM ILLUMINATED DISK-LIKE OBJECTS

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Multidimensional radiative transfer modeling has become necessary in order to properly model emerging line radiation from various astrophysical objects. Scattering polarization (i.e. Stokes Q and U) is even more sensitive to multidimensionality and geometry of the medium then the radiation intensity. Here we present two-dimensional approach to modeling of the astrophysical disks. For objects which are axially symmetric, 2D cylindrical geometry successfully replaces 3D Cartesian geometry, thus saving lot of computing time and memory. We solve unpolarized part of the computation via standard Jacobi iteration, used with the short characteristics method of formal solution. Polarized part is solved by switching to reduced intensity basis and performing lambda iteration for polarized part only. We apply our code to several models of circumstellar and accretion disks and discuss potential diagnostics capabilities of modeling spectral line polarization from these objects.