Numerical solution of the quantum Lenard-Balescu equation for non-degenerate plasmas[1] FRANK GRAZIANI, CHRISTIAN SCULLARD, Lawrence Livermore National Laboratory, ANDREW BELT, SUSAN FENNELL, MARIJA JANKOVIC, NATHAN NG, SUSANA SERNA, Institute for Pure and Applied Mathematics — For weakly-coupled plasmas, time-dependent non-equilibrium effects are usually studied by numerically solving the Landau equation in Fokker-Planck form. This system requires an input Coulomb logarithm, which adds a level of ambiguity to the calculation that can only be remedied by considering a more sophisticated collision operator. We have recently developed a spectral method for numerically solving the quantum Lenard-Balescu equation, which includes the effects of both quantum diffraction and dynamic screening, eliminating the divergences that require an input Coulomb logarithm. Our method allows a fast and accurate integration over the dielectric function for general non-equilibrium distributions. I will present calculations on various systems, including one- and two-component plasmas, and comparisons with the Landau equation. I will also discuss future prospects for the method.

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