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Fast metaplectic algorithm for RF simulations NICOLAS LOPEZ, Princeton University, ILYA DODIN, Princeton University, PPPL — The WKB approximation for modeling waves in inhomogeneous plasma is known to break down at cutoffs (caustics). However, it can be reinstated if the wave propagation is considered in the ray phase space rather than in the configuration space as usual. In particular, fold caustics can be treated by continually rotating the phase space such that the projection of the dispersion surface onto the coordinate plane is never singular, thereby restoring the geometrical-optics approximation. Here, we discuss a new fast algorithm for performing such phase-space rotations, or more generally, linear canonical transformations of the phase space. We also describe how this algorithm can feature in a reduced code for modeling RF waves which keeps the wave amplitude finite at cutoffs.

Nicolas Lopez
Princeton University

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