Simulating Infinite Vortex Lattices in Superfluids LUCA MIN-
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present an efficient framework to numerically treat infinite periodic vortex lattices
in rotating superfluids described by the Gross-Pitaevskii theory. The commonly
used split-step Fourier (SSF) spectral methods are inapplicable to such systems as
the standard Fourier transform does not respect the boundary conditions mandated
by the magnetic translation group. We present a generalisation of the SSF method
which incorporates the correct boundary conditions by employing the so-called mag-
netic Fourier transform. We test the method and show that it reduces to known
results in the lowest-Landau-level regime. Furthermore we extend such results to
strong-interaction regimes and to the multicomponent case.

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