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Determining the Time Evolution of Bose-Einstein Condensate\textsuperscript{1} 
MERIDETH FREY, Wellesley College — Bose-Einstein condensates (BEC) offer a 
macroscopic way to analyze the quantum mechanical world. In order to measure 
most properties of these condensates, the cooled atomic gas must be released from 
its potential trap and allowed to expand. Oftentimes an analytic solution for the 
time-evolution of the BEC wavefunction after release from the trap cannot be found 
and a numerical solution is needed. By applying a recent numerical method for 
solving the Gross-Pitaevskii equation, the time-evolution for BEC after release from 
potential traps of various geometries can be found. For this project, spherically and 
cylindrically symmetric traps are analyzed. When applicable, the numerical results 
are compared with analytical solutions to evaluate the error in the method. Numeri-
cal solutions will also be found for potential trap geometries that produce interesting 
interference effects due to the quantum behavior of Bose-Einstein condensates.

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