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**Expected Properties and Experimental Signals of Bose-Einstein Condensates** MONA ALI, Wellesley College, Wellesley, Massachusetts 02481, COURTNEY LANNERT, Wellesley College, Wellesley, Massachusetts 02481 — We have studied the expected response of Bose Einstein Condensed (BEC) atoms subject to various experimental probes. In the first part of this project, we modeled BEC atoms passing through a double slit and predicted the interference patterns that are expected to form on the screen. We contrast these interference patterns with those from thermal atoms and compare the patterns from condensed atoms with varying levels of inter-atomic interactions. This gives an experimental signature of the presence of BEC in the system as well as the strength of interactions. The second part of our project considers the response of BEC atoms trapped in an optical lattice, subject to an external oscillatory magnetic field. This system is modeled as having two discrete hyperfine energy states and we find the expected transitions between these states for the BEC atoms. The transitions are found to be similar to the Rabi oscillations observed with non-BEC atoms, subject to the same probe, with some notable differences.

Mona Ali
Wellesley College, Wellesley, Massachusetts 02481

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