Superfluid to Mott-insulator transition of hardcore bosons in a superlattice ITAY HEN, MARCOS RIGOL, Georgetown University — We present results of analytical and numerical studies of the superfluid to Mott-insulator transition of hardcore bosons in a superlattice potential in arbitrary dimensions. In this study, we use mean-field plus spin-wave corrections and the stochastic series expansion (SSE) algorithm to compute various properties of the system, such as the ground-state energy, the condensate fraction, the superfluid density, and the compressibility. We will show that in some cases the spin-wave approximation is in remarkable agreement with the exact numerical results.

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