

Abstract Submitted
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Synthetic electromagnetic forces in ultracold atoms BENJAMIN SMITH, LOGAN COOKE, TARAS HRUSHEVSKYI, LINDSAY LEBLANC, University of Alberta — Employing the familiar Raman coupling scheme in a $F=1$ ^{87}Rb BEC, we explore the possibility of engineering a uniform artificial vector potential with periodic time-dependence in our experiments. By sinusoidally modulating the two-photon Raman detuning, we show how a uniform AC synthetic electric field emerges. Extending on this effect, we can introduce a static magnetic field gradient to produce an AC synthetic magnetic field, due to the curl of vector potential. In addition, we also study this system numerically by simulating the quasi-3D Gross-Pitaevskii equation. In this talk, I will discuss our recent progress, as well as exploring some of the similarities and differences between our results and those predicted by Maxwell's equations, particularly the effects of interactions.

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