**Stability of two-component and spinor condensates in optical lattices** ZACHARY DUTTON, Naval Research Lab, JANNE RUOSTEKOSKI, University of Southampton, School of Applied Mathematics — We carry out an analysis of two-component (spin $1/2$) and spinor (spin 1) BECs in optical lattices. Using a Bogoliubov approach, we derive analytic conditions for the stability of these systems for both moving and stationary condensates in terms of the BEC interaction parameters and lattice kinetic energy. Both energy instabilities and dynamical instability conditions are derived and our results include both positive and negative interaction strengths. In both the two-component and spinor cases, we find the stability phase diagram closely reflects the free space case.

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