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Improving Ramsey interferometry using STIRAP BRANDEN TATASCIORE, FRANK NARDUCCI, The Naval Postgraduate School — We have been investigating Ramsey and spin-echo interferometry in continuous beam atom interferometers. Atoms experience pulses of light due to their transit time through Raman fields that are also on continuously. We have earlier demonstrated that the atoms in our system, which originate from a two-dimensional magneto-optical trap to reduce their transverse temperature, also have a low average longitudinal velocity. However, they still have a spread in their velocities which leads to pulse errors. Our earlier modeling and experiments have shown that averaging over the longitudinal velocity leads to the removal of all the Ramsey fringes except the central one. Stimulated Raman adiabatic passage, on the other hand, is a more robust method of coherently transferring population and should be more robust to pulse errors and therefore to velocity averaging. Our preliminary modeling shows this to be true in our system. In this talk, we present the results of the modeling of our system and discuss experimental implementations and considerations.

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