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Atomic beam velocity measurements using phase choppers in an atom interferometer IVAN HROMADA, WILLIAM HOLMGREN, CATHERINE KLAUSS, ALEXANDER CRONIN, University of Arizona — We introduce a novel technique to measure the velocity of atoms in an atom beam interferometer. This technique uses pulsed electric fields from two phase choppers to induce π phase shifts for the atomic de Broglie waves. We find the atom beam velocity by measuring the amplitude and phase of the interference pattern as a function of pulse timing. We have demonstrated measurements of mean velocity with a precision of 0.1%, and measurements of velocity spread with a precision of 5%. This new technique directly supports high-precision measurements of atomic polarizability that we are conducting in the same atom beam interferometer apparatus.

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