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Dispersion Management Using Betatron Resonances in an Ultracold-Atom Storage Ring KATER MURCH, KEVIN MOORE, SUBHADEEP GUPTA, DAN STAMPER-KURN, UC Berkeley — Particles circulating at specific velocities in a storage ring can undergo betatron resonances at which static perturbations of the particles' orbit yield large transverse (betatron) oscillations. We have observed betatron resonances in an ultracold atom storage ring and found these resonances to cause the near elimination of the longitudinal dispersion of atomic beams propagating at resonant velocities. This effect can improve atom-interferometric devices. Both the resonant velocities and the resonance strengths were varied by deliberate modifications to the storage ring.

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