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Optical Pumping in Ultracold Neutral Plasma. HONG GAO, JOSE CASTRO, CLAYTON E. SIMIEN, SAMPAD LAHA, THOMAS C. KILLIAN, Rice University, Department of Physics and Astronomy, Houston, TX 77005 — We have studied the optical pumping by using fluorescence imaging in an ultracold neutral plasma (UNP). Velocity-changing collisions (VCC) have been observed during the optical pumping process. The collision causes the ions to quickly exchange momenta with their neighborhood and are optically pumped from ground state. We present our experimental data and discuss the VCC effect implications for laser cooling of a UNP.

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