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Streaming Ultracold Neutral Plasmas[1] PATRICK MCQUILLEN, JOSE CASTRO, THOMAS KILLIAN, Rice University — Ultracold Neutral Plasmas (UNPs) are formed by near-threshold photoionization of laser-cooled atoms. They are orders of magnitude colder than other neutral plasmas and have extremely clean and controllable initial conditions. With appropriate masking of the ionization laser, we modify the initial density distribution to create two hemispheres of plasma that stream into each other during expansion. We will discuss the interaction of these streaming plasmas, their collisionality, penetration, and stopping power. This new technique of shaping the initial density enables the study of various collective modes, plasma collisions and the effects of strong coupling.

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