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Bow Shock Formation in a Flowing Plasma Interacting with Crossed Laser Beams JOSHUA LUDWIG, University of Alberta, WILLIAM FARMER, LLNL, STEFAN HLLER, cole Polytechnique, HARVEY ROSE, LANL (Retired), GEORGE SWADLING, PIERRE MICHEL, LLNL, WOJCIECH ROZMUS, University of Alberta — High power lasers interacting with a flowing plasma can produce a plasma response that leads to beam bending and, by momentum conservation, to a drag force which slows down the plasma flow velocity [1]. When the plasma flow velocity is in the vicinity of the ion sound speed, where this plasma response is the strongest, the flow's interaction with the laser light can lead to shock formation. We report on progress in numerical and analytical studies of shock formation in the geometry of the proposed NIF experiments. Different targets have been examined in large scale hydrodynamic simulations to achieve the necessary plasma flow profile across the overlap region of crossing NIF beams. Wave interaction simulations in 2D examined the laser response, slowing of the flow and shock formation in the background plasma as described by a nonlinear hydrodynamic model. A scan of the parameter space, including the effects of temporal and spatial smoothing, and crossed beam geometry have been examined with the goal of designing an experiment on NIF. [1] H.A. Rose, Phys. Plasmas **3**, 1709 (1996).

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