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Polarization Measurements of Backscatter on NIF DAVID TURNBULL[1], JOHN MOODY, JEAN-MICHEL DI NICOLA, LAURENT DIVOL, DENISE HINKEL, ROBERT KIRKWOOD, WILLIAM KRUER, BRIAN MACGOWAN, KEN MANES, PIERRE MICHEL, JOSEPH RALPH, ED WILLIAMS, Lawrence Livermore National Laboratory — Time integrated, spatially localized measurements of the polarization of backward Stimulated Brillouin Scattering (SBS) collected by a Full Aperture Backscatter (FABS) diagnostic have been made on the National Ignition Facility (NIF). Early data from a variety of hohlraum experiments reveal that the backscatter polarization can differ significantly from that of the incident beam. Explanations for this include: more divergent backscatter from neighboring beams that have an orthogonal polarization; Crossed Beam Energy Transfer (CBET) from beams in the outer cones on NIF with polarizations that are tilted with respect to the measured beam, or even beams with nearly orthogonal polarizations (normally assumed to be non-interacting) that scatter from the beat waves driven between other pairs of beams (so-called Brillouin enhanced four-wave mixing); and Faraday rotation caused by laser generated magnetic fields within the target plasma. Preliminary analysis indicates that the dominant effect is the wider divergence of neighboring beams' backscatter. We will discuss the measurements and modeling, and also compare with previous results. This work was performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.

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