IMC Photonics in HYDRA NIF Simulations G.D. KERBEL, M.M. MARINAK, N. GENTILE, Lawrence Livermore National Laboratory — One option in the radiation hydrodynamics code HYDRA for computing radiation transport is IMC (Implicit Monte Carlo) direct simulation. Well-converged simulations run with IMC spend most of their time doing radiation transport. We desire the run time to be as short as possible for the (NIF) experimental campaign and thus we have focussed efforts on ways to speed the IMC computation. Techniques were implemented to accomplish variance reduction through angular biasing, reducing the amount of computation required for given accuracy. We have improved load balance through multi-level parallelism and dynamic domain data distribution across processes. In addition we have added domain data replication to attain strong scaling with process count as more computing resources become available. This work 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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