Evidence for species separation in direct-drive DTH-filled capsule implosions based on statistical inference and predictions with quantified uncertainty[1] NELSON HOFFMAN, YONGHO KIM, Los Alamos Natl Lab — We are using the GPMSA (Gaussian Process Models for Simulation Analysis) statistical inference code to analyze inertial-fusion capsule experiments carried out at OMEGA that were intended to investigate the separation of H, D, and T ions during the implosion. A set of DT-filled capsules provide a reference observed-data set, while radiation-hydrodynamic simulations with an ion-diffusion transport model provide a simulation tool for explaining the data. GPMSA is used to infer model parameter distributions, and generate the predicted behavior of DTH-filled capsules, with uncertainty bounds. If observed DTH capsule performance departs significantly from the predicted performance, we regard that departure as evidence for an unexplained degree of species separation in such implosions. This approach allows us to assign confidence levels to such conclusions.

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