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A Model for the Growth of Localized Shell Features in Inertial Confinement Fusion Implosions V.N. GONCHAROV, Laboratory for Laser Energetics, U. of Rochester — Engineering features and target debris on inertial confinement fusion capsules play detrimental role in target performance. The contact points of such features with target surface as well as shadowing effects[1] produce localized shell nonuniformities that grow in time because of the Rayleigh–Taylor instability developed during shell acceleration. Such growth leads to significant mass modulation in the shell and injection of ablator and cold fuel material into the target vapor region. These effects are commonly modeled using 2-D and 3-D hydrodynamic codes that take into account multiple physics effects. Such simulations, however, are very challenging since in many cases they are inherently three dimensional (as in the case of fill tube or stalk shadowing) and require very high grid resolution to accurately model short-scale features. To gain physics insight, an analytic model describing the growth of these features has been developed. The model is based on the Layzer-type approach.[2] The talk will discuss the results of the model used to study perturbation growth seeded by localized target debris, glue spots, fill tubes, and stalks. This material is based upon work supported by the Department of Energy National Nuclear Security Administration under Award Number DE-NA0001944.

[1]A. G. MacPhee *et al.*, Phys. Rev. E **95**, 031204(R) (2017).
[2]V. N. Goncharov and D. Li, Phys. Rev. E **71**, 046306 (2005).

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