

Analysis of the effect of radiation absorption spectral coefficients in the indirect thermonuclear target ablator on the ignition conditions in the NIF laser

Vladislav ROZANOV¹, Galina VERGUNOVA¹ and Alexander GRUSHIN²

1) *P.N. Lebedev Physical Institute of the RAS, Moscow, Russia*

E-mail: verg@sci.lebedev.ru

2) *Keldysh Institute of Applied Mathematic RAS, Moscow, Russia*

With the help of 1D RADIANT code the published experimental data on indirect target compression at the megajoule NIF laser have been analyzed and interpreted. Basing on the available data, the authors consider one of the possible reasons for indirect target “nonignition” associated with the radiative transfer from the hohlraum. It may be that the ablator material turns to be more transparent for the radiation typical quanta, and the DT layer heating (the compression adiabat) under compression turns to be higher as compared to those used in the calculation. The processes of instability, mixing and heating of the ablator (or part of the ablator adjacent to the DT layer) increase the ablator transparency as a whole (separate parts of the ablator may become less transparent), increase the radiation flows into the target, and the mentioned processes may be responsible for the elevated heating of the layers containing DT fuel. It is quite possible that a combination of the ablator “transparency” effect and taking into account 2D and 3D processes under real initial conditions will result in the agreement between the calculation and experimental data and more accurate formulation of the ignition conditions.