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Temperature control and sensitivity of low ice modes in a NIF scale hohlraum J.D. MOODY, J.J. SANCHEZ, B.J. KOZIOZIEMSKI, R.A. LONDON, J.D. SATER, LLNL — Direct and indirect drive ignition schemes require smooth Deuterium-Tritium (DT) ice layers on the inner surface of the fuel shell. These ice layers are grown slowly from liquid into a solid shell with an outer radius of about 0.9 mm and thickness of about 0.1 mm. The inner surface ice roughness is characterized in terms of a spatial power spectrum from which the RMS amplitude for any scalelength of roughness can be obtained. Short scalelength ice roughness is determined mainly by hydrogen crystal properties and long scalelength roughness primarily by the surrounding thermal environment. The shell is placed in the center of a gold cylinder or hohlraum in the indirect drive scheme. Active heating (called thermal shimming) is applied to the hohlraum surface to create spherical isotherms at the inner ice surface. It is important to determine that active heating can control the ice low mode roughness with sufficient accuracy. We describe experiments and modeling which investigate the control of long scalelength ice modes in the fuel ice layer of an indirect drive target with imposed thermal perturbations on the hohlraum wall. Work performed under the auspicies of the U.S. DOE by UC, LLNL contract number W–7405–ENG–48

John Moody
Lawrence Livermore National Lab

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