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A survey of pulse shape options for a revised plastic ablator ignition design¹ DANIEL CLARK, DAVID EDER, STEVEN HAAN, DENISE HINKEL, OGDEN JONES, MICHAEL MARINAK, JOSE MILOVICH, JAYSON PETERSON, HAROLD ROBEY, JAY SALMONSON, VLADIMIR SMALYUK, CHRISTOPHER WEBER, Lawrence Livermore National Laboratory — Recent experimental results using the “high foot” pulse shape on the National Ignition Facility (NIF) have shown encouraging progress compared to earlier “low foot” experiments. These results strongly suggest that controlling ablation front instability growth can dramatically improve implosion performance, even in the presence of persistent, large, low-mode distortions. In parallel, Hydro. Growth Radiography experiments have so far validated the techniques used for modeling ablation front growth in NIF experiments. It is timely then to combine these two results and ask how current ignition pulse shapes could be modified so as to improve implosion performance, namely fuel compressibility, while maintaining the stability properties demonstrated with the high foot. This talk presents a survey of pulse shapes intermediate between the low and high foot extremes in search of a more optimal design. From the database of pulse shapes surveyed, a higher picket version of the original low foot pulse shape shows the most promise for improved compression without loss of stability.

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