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Pellet ignition using shock-accelerated ions in the corona R. BINGHAM, Rutherford Appleton Laboratory, Didcot, UK, R.A. CAIRNS, University of St Andrews, UK, E. BOELLA, M. VRANIC, L.O. SILVA, IST Lisbon, Portugal, R. TRINES, P. NORREYS, Rutherford Appleton Laboratory, Didcot, UK
— Recently we have suggested that fast ignition with ions might be possible using a scheme in which, towards the end of the compression phase in inertial fusion, a sequence of intense short pulses is used, first to heat the corona to a high temperature then to launch a shock wave to accelerate ions into the compressed core. This is in contrast to other ion fast ignition schemes in which a separate target is envisaged for the generation of the ions. Initial estimates of the range of energetic ions moving into the core suggest that ions in the 1-10 Mev range will deposit their energy when the density reaches $10^{25} - 10^{26}$ cm^{-3}. We will report on detailed studies to identify the range of corona temperatures and shock Mach numbers needed to produce ions of the energy necessary to produce core heating. With the aid of computer simulations of the heating of the corona and production of shock waves in the resulting high electron temperature plasma we will study the requirements for laser systems to make this scheme viable.

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