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Hadronization of QGP over timelike hypersurfaces and its extension to fusion reactions with nano-plasmonics

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The present status of fusion research and development is hindered by hydrodynamical instabilities occurring at the intense compression of the target fuel by energetic laser beams. A recent patent combines advances in two fields: Detonations in relativistic fluid dynamics (RFD) and radiative energy deposition by plasmonic nano-shells. The initial compression of the target pellet can be decreased, not to reach the Rayleigh–Taylor or other instabilities, and rapid volume ignition can be achieved by a final and more energetic laser pulse, which can be as short as the penetration time of the light across the pellet. The
absorptivity of the target can be increased by one or two orders of magnitude
by plasmonic nano-shells embedded in the target fuel. Thus, higher ignition temperature and radiation dominated dynamics can be achieved with the limited initial compression. A short final light pulse can heat the target so that most of the interior will reach the ignition temperature simultaneously based on the results of RFD. This makes the development of any kind of instability impossible, which would prevent complete ignition of the target.

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