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1D-Numerical investigation of the interaction of counter propagating laser ablative shock waves in air.[1] PREM KIRAN PATURI, SAI SHIVA S, NAGARAJU GUTHIKONDA, ACRHEM, University of Hyderabad, VENKATA RAMANA IKKURTHI, SIJOY C. D., CHATURVEDI SHASHANK[2], Bhabha Atomic Research Centre, Visakhapatnam, COMPUTATIONAL ANALYSIS DIVISION, BHABHA ATOMIC RESEARCH CENTRE, VISAKHAPATNAM TEAM, ACRHEM, UNIVERSITY OF HYDERABAD TEAM — A 1D-numerical model has been developed to investigate the interaction of counter propagating shock waves generated using 7 ns (FWHM) laser pulses and with 532 nm wavelength is presented. The simulations have been carried out using Lagrangian one dimensional radiation hydrodynamic code. The model takes into consideration the electron-ion inverse bremsstrahlung absorption coefficient for the laser energy deposition process. Similarly, the plasma behavior is assumed to follow the ideal gas equation of state with the charge state effects taken into account. The two shock waves are created by focusing the laser energy at two different focal points in the counter propagating direction. The distance between the two points is varied from 0.5 – 10 mm. The input laser energy at one source is fixed to 25 mJ, whereas the other side is varied from 25- 96 mJ. The plasma and shock wave interaction dynamics were observed to vary with varying energy deposition and distance between the two sources. The numerical results were compared with the experimental observations along the laser axis over the time scales of 0.4 - 4 μs.

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