Abstract

Title: Novel Investigations of Weakly coupled plasma upon Laser Impingement

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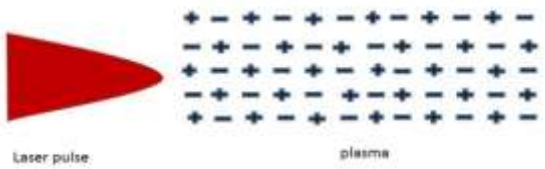
Keywords: Laser, Plasma, Weakly Coupled, Collisions.

I. Abstract Body (up to 250 words)

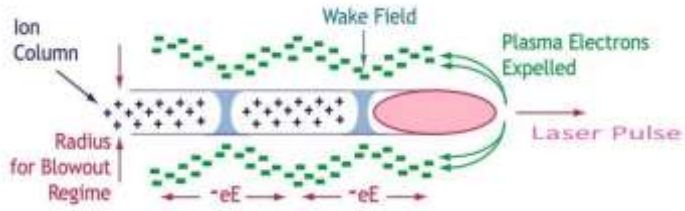
Mostly standard plasma systems are weakly coupled ($\Lambda >> 1$) characterised by strength of coupling between plasma species is described in terms of Coulomb logarithm (Λ) parameter which is densely populated and tends to be diffusive and warm. In a weakly coupled plasma, collision frequency (ν) is much smaller than the plasma frequency (ω_p) i.e. $\nu << \omega_p$. Hence, collisions do not affect plasma oscillations much. In view of this diffusive and high temperature plasmas tend to be collision-less or weakly collisional. Before passage of laser pulse, plasma is assumed to be in equilibrium but with laser pulse impinges onto it, the plasma dynamics changes collectively giving rise to several phenomenon simultaneously viz. laser filamentation, self-focusing, harmonic generation, wake field acceleration, radiation emission etc. characterized by laser and plasma parameters. Two lasers can also be used to excite beat wave oscillations in the plasma. Investigations is to be carried out for laser beam widh, pulse profile, plasma density, collisions, external DC magnetic field, electric field to examine these underlying phenomenon of laser induced plasma.

Thus plasma serves as an excellent medium for intense laser propagation through it giving rise to above mentioned several interesting phenomenon the have extensive application. That's why laser plasma interaction is a highly enriched field which opens up a big opportunity to researchers working in this are across the globe.

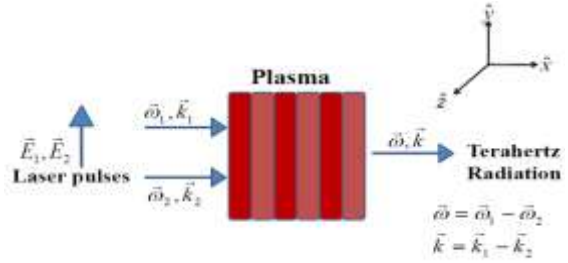
II. Image:



Schematic before passage of laser pulse through plasma



Schematic with laser passed through the plasma



Schematic with two laser passed through the plasma

III. Reference:

1 D. Singh and H. K. Malik, Phys. Plasmas **21**, 083105, (2014).

2. D. Singh and H. K. Malik, Plasma Sources Science & Tech. **24**, 045001, (2015).

3. R. Gill, D. Singh and H. K. Malik, Journ. of TheoreticalApplied Physics 11, 103–108 (2017).

Biography: born on February 3, 1984 in Agra, India known as the Taj City having one of the world wonder "TajMahal". She completed her doctorate degree from Indian Institute of Technology Delhi, India in the year 2016 entitled "Terahertz Radiation Generation via Laser Plasma Interaction in collisional Plasma". Her research interest includes theoretical plasma physics and underlying phenomenon, laser plasma interaction etc. presently she is working as an assistant professor in Department of Physics & electronics of the Rajdhani college, University of Delhi.

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