

## Parametric processes for laser interacting with magnetized plasma observed by

### Particle – In – Cell simulations

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Lately there has been interest in the study of magnetized response of plasma to an interacting laser field [1, 2, 3]. Studies in this regime has unraveled many novel observations related to laser energy absorption [4, 5], generation of harmonic radiation [6], complete transparency of electromagnetic radiation [6, 7] etc. Here our recent studies carried out with the help of Particle – In – Cell (PIC) simulations (using OSIRIS [8] and EPOCH [9] platforms) for understanding the excitation of parametric processes (e.g., Brillouin scattering) in the context of magnetized plasmas, will be presented. The detailed identification of the process along with the appropriate conditions for such a process to occur will be delineated.

#### References

- [1] Jha et al, *Physics of Plasmas*, 12(12):123104, 2005
- [2] A Das, *Reviews of Modern Plasma Physics*, 4(1):1 – 16, 2020
- [3] Vashistha et al, *Nuclear Fusion*, 61(2): 026016 , 2021
- [4] Vashistha et al, *New Journal of Physics*, 22: 063023, 2020
- [5] Maity et al, *Journal of Plasma Physics*, 87(5), 2021
- [6] Goswami et al, *Plasma Physics and Controlled Fusion*, 63(11):115003, 2021
- [7] Mandal et al, *Scientific Reports*, 11(1), 2021
- [8] Fonseca et al, *Plasma Physics and Controlled Fusion*, 50 (12):124034, 2008
- [9] Arber et al, *Plasma Phys. Control. Fusion*, 57:113001, 2015

