

## Magnetic field generation behind intense photon propagation

Masahiro Hoshino<sup>1\*</sup>, Luis Silva<sup>2</sup>, Samuel Martins<sup>2</sup>

<sup>1</sup>University of Tokyo, <sup>2</sup>Instituto Superior Tecnico

A new mechanism of self-generation of magnetic field induced by interaction between an intense coherent photon pulse and a uniform plasma medium is discussed by using plasma particle-in-cell simulations. Due to the Raman side scattering in the course of photon propagation, electron can be preferentially heated in perpendicular direction to the laser pulse propagation, and the electron temperature anisotropy can be subsequently produced. As a result the Weibel instability due to the temperature anisotropy can feature the generation of magnetic field behind the photon pulse.

**Keywords:** relativistic plasma, magnetic field generation, radiation, Raman scattering, Weibel instability