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**Conical terahertz radiation from femtosecond laser created filaments** NOBORU YUGAMI, TAKAMITSU OTSUKA, KAZUKI OGURI, TAKEHARU HONMYO, MASATAKA HIDETA, Utsunomiya University, YASUHIKO SENTOKU, University of Nevada at Reno — The mechanism of sub-THz emission with conical structure by laser and plasma interaction since the discovery of Yugami *et. al.* in 2006 has left unresolved.<sup>1</sup> One tried to explain by the wakefield oscillation by laser pulse, however, it is impossible to generate sufficient electric field for sub THz radiation due to high neutral gas pressure and low intense laser pulse. Furthermore, the radiation frequency is not identical to and much lower than the plasma frequency which is estimated by the initial gas density and laser intensity. In this presentation, we will present recent experimental data and explain the radiation generation mechanism by 2DPIC code by taking plasma density gradient and the electron current behind the laser propagating into account.<sup>2</sup> The calculation shows the existence of the radiation with lower than 1 THz, which is much lower than the local plasma frequency and distribution structure around focal point of the laser.

<sup>1</sup>N. Yugami *et.al.*, Jpn. J. Appl. Phys. **45** L1051 (2006).

<sup>2</sup>H.-C.Wu *et.al.*, Phys. Rev. E, **83**, 036407 (2011).

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