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Harmonic generation induced by an interaction between carbon nanotubes and intense laser field[1] TOSHIHIRO TAGUCHI, Setsunan University, THOMAS ANTONSEN, HOWARD MILCHBERG, University of Maryland, MASAHIKO INOUE, Setsunan University — When an intense laser is irradiated on atomic clusters, strong electromagnetic radiation is generated in a wide frequency range. We reported about a nonlinear resonance absorption takes place when a laser intensity exceeds a threshold value determined by the size of a cluster [1–2]. Such a resonance drives a large electron motion and then strong coherent electromagnetic waves are generated. When a broad-band laser is used for such an interaction, the nonlinear electron motion couples different frequency modes. As a result, it is expected that a wide range of coherent radiation is emitted including waves whose frequency is lower than the incident laser light. Since carbon nanotubes can be used as cylindrical clusters, we have analysed the radiation spectrum from a laser-carbon nanotube interaction using our collisional-ionization PIC code. Enhancement of the low frequency radiation from periodically aligned carbon nanotubes will also be shown.

[1] T. Taguchi, et al., Phys. Rev. Lett., 92, 20, 2004, 205003.
[2] T. M. Antonsen, Jr., et al., Phys. Plasmas 12, 5, (2005), 056703.

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