

Abstract Submitted
for the DPP17 Meeting of
The American Physical Society

Focusing and up-shift of laser light by relativistic flying mirrors in the high power and large wavelength difference regime¹ JAMES KOGA, SERGEI V. BULANOV, TIMUR ZH. ESIRKEPOV, MASAKI KANDO, National Institutes for Quantum and Radiological Science and Technology — Frequency up-shift and compression of electromagnetic waves by relativistic flying mirrors (RFM) have been demonstrated theoretically, numerically and experimentally (see review [1]). RFM are generated with ultra-high power laser pulses (driver pulses) propagating in plasma from breaking plasma waves. Lasers counter-propagating to the breaking plasma waves (source pulses) are reflected, up-shifted and compressed. Here, we investigate the focusing and reflectivity where source pulses with varying intensity have a much longer wavelength than the driver pulse and where both pulses are the same intensity using 2D particle-in-cell simulations. We show that the source pulse can significantly modify the RFM at high intensity and show the generation of harmonics when both pulses are the same intensity. [1] S. V. Bulanov, et al., Phys. Usp. 56, 429 (2013).

¹This work was supported by JSPS KAKENHI Grant Number JP16K05639

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Date submitted: 11 Jul 2017

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