Abstract Submitted
for the DPP08 Meeting of
The American Physical Society

Terahertz radiation source from an electrostatic field using a laser-produced ionization front HIROFUMI NISHIMAI, TAKESHI HIGASHIGUCHI, NOBORU YUGAMI, CORE, Utsunomiya University, PATRIC MUGGLI, University of Southern California — THz sources are developing for various applications such as a test of semiconductor materials. The photoconductive (PC) antenna emits the THz radiation with a low power of the order of nW level. A plasma-based DC to AC radiation converter (DARC), which was proposed by W. B. Mori *et al.* (UCLA), can directly convert from an electrostatic field to an electromagnetic wave. When a laser-produced ionization front propagates through an electrostatic field, it generates a burst of current and a half- cycle pulse of radiation with high power. The radiation frequency of the DARC source depends on the electron density behind the ionization front and the wavenumber of the electrostatic field. In the present case, the temporal waveform of the THz radiation was observed. Two cycles wave with a period of 0.8 ps was observed. The Fourier spectrum of the temporal waveform has a peak of 1.2 THz with a bandwidth of 0.7 THz (FWHM). We study the gas-filled DARC source to produce the radiation with high output power. We characterize the frequency and the power of the radiation using a sampling method and a Si-bolometer, respectively.

Takeshi Higashiguchi
CORE, Utsunomiya University

Date submitted: 16 Jul 2008 Electronic form version 1.4