Abstract Submitted
for the GEC11 Meeting of
The American Physical Society

Evaluation of Penicillium digitatum sterilization using non-equilibrium atmospheric pressure plasma by terahertz time-domain spectroscopy TAKEHIRO HIRAOKA, NOBORU EBIZUKA, KEIGO TAKEDA, Nagoya Univ., TAKAYUKI OHTA, Meijo Univ., HIROKI KONDO, KENJI ISHIKAWA, KODO KAWASE, Nagoya Univ., MASAFUMI ITO, Meijo Univ., MAKOTO SEKINE, MASARU HORI, Nagoya Univ. — Recently, the plasma sterilization has attracted much attention as a new sterilization technique that takes the place of spraying agricultural chemicals. The conventional methods for sterilization evaluation, was demanded to culture the samples for several days after plasma treatment. Then, we focused on Terahertz time-domain spectroscopy (THz-TDS). At the THz region, vibrational modes of biological molecules and fingerprint spectra of biologically-relevant molecules were also observed. In this study, our purpose was measurement of the fingerprint spectrum of the Penicillium digitatum (PD) spore and establishment of sterilization method by THz-TDS. The sample was 40mg/ml PD spore suspensions which dropped on cover glass. The atmospheric pressure plasma generated under the conditions which Ar gas flow was 3slm, and alternating voltage of 6kV was applied. The samples were exposed the plasma from 10mm distance for 10 minutes. We could obtain the fingerprint spectrum of the PD spore from 0.5 to 0.9THz. This result indicated the possibility of in-situ evaluation for PD sterilization using THz-TDS.

Takehiro Hiraoka
Nagoya Univ.

Date submitted: 20 Jul 2011 Electronic form version 1.4