

Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

Characteristics of Helicon-Plasma Produced Using a Segmented Multi-Loop Antenna III¹ TAKAO TANIKAWA, Tokai Univ., Japan, TAISEI MOTOMURA, SHUNJIRO SHINOHARA, Kyushu Univ., Japan — Tokai Helicon Device (THD), which has been used to study lower-hybrid cavitons [1], is a helicon-type plasma device which utilizes a specially designed flat segmented multi-loop antenna to excite a helicon wave. The antenna, which is installed just outside a quartz window at the end of the vacuum vessel (20 cm i.d. and 100 cm length), consists of four concentric loops [2]. Each loop is divided into several segments. By changing the electrical connections among the antenna segments, it is possible to excite $m = +1$ and $+2$ modes as well as $m = 0$ mode, where m is the azimuthal mode number. The discharge characteristics of the $m = 0$ excitation cases were previously reported in detail [2]. The discharge characteristics of the $m = +1$ and $+2$ cases will be presented. Excited wave characteristics of produced plasma will also be discussed. We have been using THD to develop a new plasma acceleration scheme for an advanced concept electric propulsion system. This application will be briefly discussed.

[1] T. Tanikawa *et al.*, Bull. Ameri. Phys. Soc. **54** (15), 125 (2009).

[2] T. Tanikawa *et al.*, Bull. Ameri. Phys. Soc. **51** (7), 164 (2006); T. Tanikawa and S. Shinohara, *ibid.* **53** (14), 174 (2008).

¹Work supported by Grant-in-Aid for Scientific Research, Japan.

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Date submitted: 22 Jul 2010

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