

Abstract Submitted
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Wave Characteristics of Large-Diameter, High-Density Helicon Plasma with Short Axial Length II¹ TAISEI MOTOMURA, SHUNJIRO SHINOHARA, Kyushu Univ., Japan, TAKAO TANIKAWA, Tokai Univ., Japan, KONSTANTIN P. SHAMRAI, INR, Ukraine — We have demonstrated that a large-diameter, high-density ($\geq 10^{12}$ cm⁻³) helicon plasma can be produced in a low aspect ratio (the ratio of the axial length L to the diameter R ; in our case, $R=73.8$ cm and 5.5 cm $\leq L \leq 35$ cm) device using a flat spiral antenna (4-turn, 43 cm in diameter) installed just outside the quartz-glass window at one end of the device [1]. As a first step to understand the role of helicon waves in the discharge process, helicon wave characteristics in plasma has been investigated in detail [2]. It has been found that discrete axial eigenmodes, whose characteristics depend on the plasma density profile and the axial boundary conditions, exist in the excited helicon wave. The effects of the background magnetic field profile and the rf input power on the excited wave have also been examined in detail. [1] T. Motomura *et al.*, J. Plasma Fusion Res. Ser., in press. [2] T. Motomura *et al.*, Bull. Ameri. Phys. Soc. **53** (14), 175 (2008).

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