

Abstract Submitted
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Characteristics of High-Density Helicon Plasma with Large Diameter Excited by a Flat Spiral Antenna¹ SHUNJIRO SHINOHARA, KENJI TANAKA, TAISEI MOTOMURA, KATSUHIKO MURAKAMI, Kyushu Univ., Japan — Helicon sources have been extensively investigated because of their efficient plasma production, and large diameter (45-74 cm), high-density ($\sim 10^{13} \text{ cm}^{-3}$) plasmas have been produced, using flat spiral antennas [1,2]. However, an effect of the magnetic field configuration on plasma performance has not been fully investigated. In addition, a short axial length, i.e., low aspect ratio, in some cases is desirable. These subjects are investigated using a vacuum chamber, whose diameter and axial length are 40 and 120 cm, respectively, with a movable end plate to change the axial plasma length, and also eight magnetic field coils. With the increase in the degree of the convergent field, threshold rf power for density jumps decreases. Furthermore, the lower threshold power to have density jumps is found, increasing the argon fill pressure. Detailed results in addition to the shorter axial length case will also be presented. [1] S. Shinohara *et al.*, Jpn. J. Appl. Phys. **35** (1996) 4503, [2] S. Shinohara and T. Tanikawa, Rev. Sci. Instrum. **75** (2004) 1941.

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