

Abstract Submitted  
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**High-Beta Plasma Characteristics Using Helicon Sources**<sup>1</sup> SHUNJIRO SHINOHARA, DAISUKE KUWAHARA, KAZUKI YANO, Tokyo Univ. Agr. & Technol., Japan, AMNON FRUCHTMAN, Holon Inst. Technol., Israel — Helicon sources have been extensively investigated because of their efficient high-density (up to  $\sim 10^{13} \text{ cm}^{-3}$ ) plasmas production in a wide range of operational parameters. Using this source with a large diameter of 74 cm [1], high-beta ( $\sim 1$ ) plasma characteristics have been investigated. The magnetic field less than  $<120 \text{ G}$  was measured with and without plasma, so that the reduction rate of the magnetic field, i.e., the diamagnetic effect due to the plasma, was evaluated. For a large magnetic field and/or a low fill pressure, the reduction of the magnetic field pressure was found to be nearly equal to the plasma pressure, confirming balance between magnetic and plasma pressures. For a low magnetic field and/or a high fill pressure, however, the magnetic field was hardly changed. We suggest that the neutral pressure associated with a neutral depletion plays a role in weakening of the diamagnetic field. Detailed results with a theoretical analysis will be presented.

[1] S. Shinohara and T. Tanikawa, Rev. Sci. Instrum. **75** (2004) 1941.

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