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Controll of microwave propagation in and around cylindrical plasma with additional anisotropic layers YUKI KABE, The University of Shiga Prefecture, AKINORI IWAI, Kyoto University, ALEXANDRE BAMBINA, SHIGEYUKI MIYAGI, OSAMU SAKAI, The University of Shiga Prefecture — Microwaves are used for wireless communication though the range of frequencies, but their propagation paths are limited with poor controllability, which causes confusion between antennas. Cloaking effects which reduces scattering waves [1] were demonstrated by using solid metamaterials whose anisotropic and space-gradient refractive index was critical. However, the property of cloaking is fix by the design. To control the propagation path of microwaves dynamically using a plasma generated in a glass column, we observed to reduce the reception intensity of the antenna surrounded by the plasma by 80 % for 2.4 GHz waves. We found that the capacitively coupled plasma (CCP) enhanced reduction rate better than our previous result [2], and confirmed reduction of scattering waves by insertion of metamaterials with anisotropic permeability by the numerical simulation [3]. We confirmed experimentally significant reduction of the scattering waves in the combination of the CCP and metamaterials. [1] R. A. Shelby, D. R. Smith, S. Schultz, Science 292, 77 (2001). [2] O. Sakai, S. Yamaguchi, A. Bambina, A. Iwai, Y. Nakamura, Y. Tamayama and S. Miyagi, Plasma Phys. Control. Fusion 59, 014042 (2017). [3] A. Bambina, S. Yamaguchi, A. Iwai, S. Miyagi, and O. Sakai, AIP Advance 8, 015309 (2018).

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