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Estimation of Electron Temperature and Frequency Components in a Dual Frequency Capacitively-Coupled Plasma Processing Reactor TORU ITO, YUN MO, HORIGOME MASAHIRO, Tokyo Electron Ltd. — The measurement of electron temperature in RF plasma sources with Langmuir probes is difficult because of the influence of rf noise. We attempted to estimate the electron temperature in a capacitively-coupled plasma processing reactor with a Surface Wave Probe [1] which employs microwaves. We also estimated the frequency spectrum with the sensitive PAP [1, 2]. We measured the harmonics which appeared in the bulk plasma for various experimental conditions in the dual-frequency [60 MHz and 2MHz] capacitively-coupled plasma processing reactor. We estimated RF power spectra for several experimental conditions like RF power [500-2000W], gas pressure [3-20Pa], and gas species [Ar, CF_4]. The measurement results suggest the existence of energy transport among several frequency spectrum.

[1] K. Nakamura, M. Ohata, and H. Sugai: J. Vac. Sci. Technol. A **21**, 325 (2003).
[2] T. Shirakawa and H. Sugai : Jpn. J. Appl. Phys. **32**, 5129 (1993).

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