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Measurement of the electron temperature on microwave surface wave plasmas powered by the radial-line slot antenna MINKYU KIM, LEE CHEN, Tokyo Electron — A Langmuir probe measurement system was built to study the surface wave plasma produced by radial-line slot antenna (RLSA) [1]. The measurements were performed on the bulk plasma under wide ranges of pressure (50 – 1000 mTorr) and power (1 – 5 kW). General characteristics of surface wave plasma were shown in the measurements through the I-V curve analysis. The electron temperature is low, ~ 1 eV, and the plasma densities is high, $\geq 10^{11}$ cm^{-3}. Additional higher electron temperatures were shown in the I-V curves. This second electron temperature shown in the IV curves has different trend from the lower electron temperature. The second temperature is a function of pressure. When the pressure increases, the second electron temperature also increases. EEDF/EEPF analysis is also performed to study the trend of the second electron temperatures.

[1] C. Tian, T. Nozawa, K. Ishibasi, H. Kameyama, and T. Morimoto, "Characteristics of large-diameter plasma using a radial-line slot antenna," J. Vac. Sci. Tech. A24, Vol. 4, Jul. 2006.

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