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**VUV Emission of Microwave Driven Argon Plasma Source**[1] JULIO HENRIQUES, SUSANA ESPINHO, EDGAR FELIZARDO, ELENA TATAROVA, FRANCISCO DIAS, CARLOS FERREIRA, Institute of Plasmas and Nuclear Fusion, Instituto Superior Tecnico, Technical University of Lisbon, Portugal — An experimental and kinetic modeling investigation of a low-pressure (0.1-1.2 mbar), surface wave (2.45 GHz) induced Ar plasma as a source vacuum ultraviolet (VUV) light is presented, using visible and VUV optical spectroscopy. The electron density and the relative VUV emission intensities of excited Ar atoms (at 104.8 nm and 106.6 nm) and ions (at 92.0 nm and 93.2 nm) were determined as a function of the microwave power and pressure. The experimental results were analyzed using a 2D self-consistent theoretical model based on a set of coupled equations including the electron Boltzmann equation, the rate balance equations for the most important electronic excited species and for charged particles, the gas thermal balance equation, and the wave electrodynamics. The principal collisional and radiative processes for neutral Ar($3p^5 4s$) and Ar($3p^5 4p$) and ionized Ar($3s3p^6\ ^2S_{1/2}$) levels are accounted for. Model predictions are in good agreement with the experimental measurements.

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