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Behaviors of excited states argon atom density in ICP discharge

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Metastable statates, resonant states in 4s level and excited states in 4p level were investigated with a simple global model and examined by the LIF experiments. Metastable states exhibit an anomalous behavior with the plasma density, on the other hands, other states show monotonous increasing behaviors. It turns out that the metastable state can have such an anomalous behavior due to its special characteristic, electric dipole radiation forbidden. It is expected to resolve the ambiguity of previously reported metastable density behaviors and provide further understanding.

Keywords: plasma, discharge, ICP, metastable, multistep