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Spectrally filtered ICCD-camera imaging of dielectric barrier discharge plasma jet using two crossed gas flows KEIICHIRO URABE, Kyoto Univ., BRIAN SANDS, UES Inc./AFRL, OSAMU SAKAI, Kyoto Univ., BISWA GANGULY, AFRL — Temporally resolved imaging using an intensified charge-coupled device (ICCD) camera is one of the most effective ways for investigation of discharge behaviors in atmospheric-pressure plasmas. In a plasma jet using a dielectric barrier discharge (DBD) configuration with two crossed gas flows of pure He and Ar/acetone mixture, we have observed plasma jet propagations and transient glow discharge formation in the helium flow channel, and also a secondary discharge was ignited in the Ar/acetone flow channel when the applied voltage was in a falling slope. A transition point of the discharge between the He and Ar/acetone flows moved toward the upstream side. In order to analyze excited species formation in more detail, interference filters were used to identify discharge emissions from each excited species. From imaging results, by the spectrally filtered ICCD-camera, it was revealed that the transition point's movement was probably caused by the change of gas composition in the Ar/acetone flow, which was most likely due to the decomposition of acetone molecules by the collision with Ar metastable atoms. This effect was monitored from the time delayed C₂ Swan band emission.

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