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Dissociation profiles of oxygen in a capacitively coupled atmospheric pressure discharge NIKOLAS KNAKE, DANIEL SCHRÖDER, VOLKER SCHULZ-VON DER GATHEN, JÖRG WINTER, Ruhr-Universität Bochum — The creation of atomic oxygen in a capacitively coupled jet type discharge is investigated using spatially resolved xenon calibrated TALIF and OES. The discharge is a planar jet type 13.56MHz rf device of 1x1 mm^2 discharge cross section and an electrode length of 40 mm using a 1.4 slm helium base gas flow containing a small amount of molecular oxygen being dissociated in the discharge. The spatial build up of the dissociation profiles along the first few millimeters of the discharge channel is investigated as well as the inter electrode distribution. Studies on the variation of transmitter power, gas flux and gas mixture were performed in the plasma itself, the effluent and the transition area from plasma to effluent. To get an insight into the production and destruction processes of the oxygen molecules, it is a prerequisite to understand the atomic density build up in the plasma and the decay especially inside the transition region between core plasma and effluent. Even several millimeters outside the discharge in the effluent atomic oxygen can be found with densities up to some 10^{14} cm^{-3}. This project is supported by the DFG in the framework of "FOR1123", "SCHU-2353/1", and the "Research School der Ruhr-Universität Bochum".

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