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Control of plasma parameters in capacitively coupled plasmas operated in reactive gases via the Magnetic Asymmetry Effect[1] BIRK BERGER, MORITZ OBERBERG, DENNIS ENGEL, CHRISTIAN WOELFEL, DENIS EREMIN, JAN LUNZE, RALF PETER BRINKMANN, PETER AWAKOWICZ, JULIAN SCHULZE, Ruhr University Bochum — A major aspect of application-oriented research of capacitively coupled plasmas (CCPs) is to investigate and control particle flux energy distributions to the powered and grounded electrode. One way to facilitate this control is to make the discharge symmetry and, hence, the DC self-bias controllable by external parameters.
Recently, the effects of applying a magnetic field with an axial asymmetry, referred to as the Magnetic Asymmetry Effect, have been investigated in theoretical and experimental works. The results shown in this contribution were obtained in a geometrically asymmetric CCP driven at 13.56 MHz at pressures of up to a few Pa with a magnetron-like magnetic field configuration at the powered electrode. Introducing oxygen to the discharge is found to affect the DC self-bias, the ion energy distributions at the grounded electrode, and the RF current measured at the center of the grounded electrode. This effect is strongly dependent on the used magnetic field strength.

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