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Transient response of pulsed multi-source RF CCP discharges<sup>1</sup> THERESA KUMMERER, DAVID PETERSON, North Carolina State University, DAVID COUMOU, MKS Instruments, STEVEN SHANNON, North Carolina State University — The electrical response of a pulsed RF CCP discharge with a second CW power source is studied within the kHz timescale of a typical pulsed system. This response is compared to plasma parameters such as sheath thickness, electron density, electron temperature, and optical emission to elucidate trends with respect to operating condition. Several regions within the pulse cycle with characteristic decay constants and saturation points have been identified using voltage, current, and phase measurements from the CW powered electrode. These trends are compared to global plasma parameters measured using Langmuir probe, hairpin resonators, spectroscopy, and high time resolution in-line RF metrology. These observed transient regions have a dependence on pressure, relative power levels, pulse frequency, and gas composition. Data was taken using argon and argon-oxygen plasmas with pulsing plurality of frequency configurations where one generator is pulsed while the other maintains constant power output. The goal of this study is to parameterize conditions for active power delivery control in advanced multi-source RF systems that utilize pulsing on one or more of their power supplies.

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