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Development of Circuit Models for Extractor Components in High Power Microwave Sources JOHN LUGINSLAND, JACK WATROUS, NumerEx, KEITH CARTWRIGHT, TIM FLEMING, MIKE HAWORTH, Air Force Research Laboratory, AFRL HIGH POWER MICROWAVE TEAM — The state-of-the-art in High Power Microwave (HPM) sources has greatly improved in recent years, in part due to advances in the computational tools available to analyze such devices. Chief among these advances is the widespread use of parallel, particle-in-cell (PIC) techniques. Despite these advances, however, parallel PIC software could be greatly supplemented by fast-running parametric codes specifically designed to mimic the behavior of the source in question. These tools can then be used to develop zero-order point designs for eventual assessment via full PIC simulation. Building on the extensive literature from the vacuum electronics community, this poster will investigate the circuit models associated with the purely electromagnetic components of the extractor in the absence-of-space charge. Specifically, three-dimensional, time-domain computational electromagnetics (AFRL's ICEPIC software) will be used to investigate the modification of the resonant frequencies and mode-quality factors as a function of slot and load geometry. These field calculations will be reduced to circuit parameters for potential inclusion in parametric models and the fidelity of the resulting description will be assessed.

John Luginsland
NumerEx

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