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Electric Field Screening of Dual Tungsten and Dual Carbon Fiber Cathodes[1] WILKIN TANG, D. SHIFFLER, K. CARTWRIGHT, Air Force Research Lab, K. GOLBY, M. LACOUR, SAIC, Y.Y. LAU, University of Michigan — Field emitter arrays have the potential to provide high current density, low voltage operation, and high pulse repetition for radar and communication. The emitted current from an individual emitter could be affected by the field screening effect caused by the close proximity of its neighbors. Previous experiments have shown a degradation of current density when the packing density of the field emitter arrays is too high or too low. These experiments were conducted with 1000s of thin film field emitters. Here we describe experiments in a dual-cathode configuration. The experiments used only two field emitters with variable spacings so as to scrutinize the effects on field emission from an immediate neighbor. Analytic model and Particle-in-cell simulations are performed to compare with the experiments that used tungsten and carbon fiber cathodes.

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Wilkin Tang
Air Force Research Lab

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