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Computational modelling of plasma control using electron injection from electrode surfaces PREMKUMAR PANNEERCHELVAM, LAXMINARAYAN RAJA, The University of Texas at Austin — A common property of gamma-mode discharge is the importance of electron emission from surfaces in establishing the overall discharge structure. The secondary electron emission (SEE) from the cathode surface plays a key role in sustaining direct current glow discharges. Active control of SEE could be used to realize control over discharge properties. Chen and Eden [1] control surface electron emission in a tri-electrode microdischarge to realize gain properties in a plasma transistor device. This work discusses a computational model of a plasma transistor microdischarge device. It includes description of active surface electron emission from one of the electrode surfaces. Gain properties in the plasma by controllable injection of electrons from the surface is shown. The non-linear processes in the plasma that realize rapid increase in the plasma density and current as a function of the electron injection from the electrode is studied using the model.

[1] K.F. Chen and J.G. Eden, “The Plasma transistor: A microcavity plasma device coupled with low voltage, controllable electron emitter,” *Applied Physics Letters* 93, 161501 (2008).

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