1051-92-190 **Alexander Rand*** (arand@ices.utexas.edu), **Andrew Gillette** (agillette@math.utexas.edu) and **Chandrajit Bajaj** (bajaj@cs.utexas.edu). *Modeling Electrodynamic Field Effects for Networks of Neurons at Submicron Scales.* Preliminary report.

Seizures are abnormal bursts on synchronous brain activity. One mechanism behind intertwining neuronal processes is the electrical field effects through extracellular space. Mathematical models are developed to identify features of network connectivity and geometry which encourage synchronous behavior through field effects and are often omitted from reduced models. In order to perform simulations of these models in the associated complex domains, several mathematical constructions are important including dual Delaunay-Voronoi meshes and higher order Whitney forms. (Received August 24, 2009)