1067-92-2170 **Michael G Kerckhove*** (mkerckho@richmond.edu), University of Richmond, Department of Mathematics & Computer Science, Richmond, VA 23173. *Stable Tissue Topology and Cell Division in 3D.* Preliminary report.

The study of geometric patterns in epithelial tissue, specifically as they relate to the distribution within the tissue of the number of cells surrounding a given cell, is of considerable interest in developmental biology. Gibson, Patel, Nagpal, and Perrimon (Nature 442, August 2006), employed a Markov model of cell division in order to predict convergence of epithelial topology to a fixed equilibrium distribution of cellular polygons. Motivated by this work, we model tissues consisting of polyhedral cells whose cleavage planes are randomly oriented, deriving a formula for the evolution of the mean number of vertices, edges, and faces in the tissue in terms of the expected number of cleavage plane-edge intersections per cell. We determine a value for this parameter that results in a stable equilibrium topology for the tissue. Invoking Erreras' Rule, the rule that the plane of division corresponds to the shortest path that will halve the volume of the mother cell, we show that the topology of the uniform tiling of space by truncated octahedra, in which the number of faces per cell is 14, is stable under cell division. (Received September 22, 2010)