

Meeting: 998, Houston, Texas, SS 1A, Special Session on Graph Theory and Combinatorics

998-05-379 **Isidoro Gitler*** (igitler@math.cinvestav.mx), Departamento de Matematicas, Av. Instituto Politecnico Nacional 2508, Col. San Pedro Zacatenco, 07360 Mexico D.F., Mexico, and **Maria de Luz Gasca** and **Feliu Sagols**. *On Hamiltonian decompositions of spherical vox-solids and characterizing minimal non-inductive vox-solids.*

Topologically a vox-solid V is a connected 3-chain whose boundary is an orientable surface. A vox-solid is inductive if we can build it step by step by adding voxels (unit cubes) one by one (glueing is only allowed on faces, glueing on vertices or along edges is not allowed) and obtaining a vox-solid at each step ("not all vox-solids are inductive").

The boundary representation of a region in the plane consists of traversing around its boundary; for this the region is digitized into a finite union of pixels (unit squares). The main motivation of this work was generalizing this representation to vox-solids, which are solids digitized into a finite union of voxels (unit cubes), by also traversing their boundaries. We associate with each vox-solid a graph whose vertices correspond with the faces on its boundary, and whose edges indicate the adjacency relationship between faces.

We present some results concerning Hamiltonian decompositions of spherical vox-solids and on the characterization of minimal non-inductive vox-solids. We discuss some other problems on vox-solids as the channel assignment problem. (Received March 02, 2004)