1060-55-201   **Maxim Zyskin***, Department of mathematics, UTB, 80 Fort Brown, Brownsville, TX 78520.
        Liquid crystals in polyhedral domains: topological problems.

Configuration of liquid crystal in polyhedral domain is described by a map from polyhedron to a space (sphere), which on faces of polyhedron is restricted to be a map to subspaces (great circles of the sphere parallel to corresponding face).

Stable configurations of liquid crystal are those minimising energy functional.

We give homotopy classification of configurations of liquid crystal.

If domain is a cone, or rectangular prism, we give bounds on minimal Dirichlet energy in homotopy classes. Such bound involve spelling length problem for words in fundamental group of n-punctured sphere.

This work has applications to bi-stable liquid crystal displays. (Received March 30, 2010)