Flexible Kokotsakis Meshes

MON/BE01
17:00–17:20

Hellmuth Stachel (TU Wien)

A Kokotsakis mesh is a polyhedral structure consisting of an n-sided central polygon p_0 surrounded by a belt of polygons in the following way: Each side a_i of p_0 is shared by an adjacent polygon p_i, and the relative motion between cyclically consecutive neighbor polygons is a spherical coupler motion. Hence, each vertex of p_0 is the meeting point of four faces. In the case $n = 3$ the mesh is part of an octahedron. In a generalized version we admit that the involved polygons are nonplanar.

These structures with rigid faces and variable dihedral angles were first studied in the thirties of the last century. However, in the last years there was a renaissance: The question under which conditions such meshes are flexible (infinitesimally or continuously) gained high actuality in the field of discrete differential geometry. The goal of this presentation is to extend the list of wellknown continuously flexible examples (Bricard, Graf, Sauer, Kokotsakis) by a few new ones and to study their geometric properties.

[1] A.I. BOBENKO, T. HOFFMANN, W.K. SCHIEF: On the Integrability of Infinitesimal and Finite Deformations of Polyhedral Surfaces. In: *Discrete Differential Geometry* (A.I. Bobenko, P. Schröder, J.M. Sullivan, G.M. Ziegler, eds). Series: Oberwolfach Seminars **38** (2008), 67–93.

[2] A. KOKOTSAKIS: Über bewegliche Polyeder. *Math. Ann.* **107** (1932), 627–647.