AN ENUMERATION OF THETA-CURVES WITH UP TO SEVEN CROSSINGS

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A θ-curve is a graph embedded in S^3 which consists of two vertices and three edges, where each edge joins the vertices. In this talk, we enumerate all the prime θ-curves with up to seven crossings. We can enumerate all the θ-curves in order of crossing numbers by using a prime basic θ-polyhedron. A θ-polyhedron is a connected planar graph embedded in 2-sphere, whose two vertices are 3-valent, and the others are 4-valent. There exist twenty-four prime basic θ-polyhedra with up to seven 4-valent vertices. We can obtain a θ-curve diagram from a prime basic θ-polyhedron by substituting algebraic tangles for their 4-valent vertices. The θ-curves are mutually distinct by the Yamada polynomial, which is an invariant of a θ-curve.

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