Enumerations of theta-curves and handcuff graphs

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We enumerate all the θ-curves and handcuff graphs with up to seven crossings by using algebraic tangles and prime basic θ-polyhedra. Here, a θ-polyhedron is a connected 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 or handcuff graph diagram from a prime basic θ-polyhedron by substituting algebraic tangles for their 4-valent vertices.

References

[1]H. Moriuchi: *Enumeration of algebraic tangles with applications to theta-curves and handcuff graphs*, to appear in Kyungpook Mathematical Journal.

[2]H. Moriuchi: *An enumeration of theta-curves with up to seven crossings*, submitted.

[3]H. Moriuchi: *A table of handcuff graphs with up to seven crossings*, to appear in OCAMI Studies Vol 1. Knot Theory for Scientific Objects.