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THE TABULATION OF PRIME KNOT PROJECTIONS WITH THEIR MIRROR IMAGES UP TO EIGHT DOUBLE POINTS

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Abstract. This paper provides the complete table of prime knot projections with their mirror images, without redundancy, up to eight double points systematically thorough a finite procedure by flypes. In this paper, we show how to tabulate the knot projections up to eight double points by listing tangles with at most four double points by an approach with respect to rational tangles of J. H. Conway. In other words, for a given prime knot projection of an alternating knot, we show how to enumerate possible projections of the alternating knot. Also to tabulate knot projections up to ambient isotopy, we introduce arrow diagrams (oriented Gauss diagrams) of knot projections having no over/under information of each crossing, which were originally introduced as arrow diagrams of knot diagrams by M. Polyak and O. Viro. Each arrow diagram of a knot projection completely detects the difference between the knot projection and its mirror image.

1. Introduction

Arnold ([2, Figure 53], [3, Figure 15]) obtained a table of reduced knot projections (equivalently, reduced generic immersed spherical curves) up to seven double points. In Arnold's table, the number of prime knot projections with seven double points is six. However, this table is incomplete (see Figure 1, which equals [2, Figure 53]).

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