

Speaker: Verchinine, Vladimir

Title: Semigroup of three-page embeddings of singular knots

Authors: Vladimir Verchinine

Affiliations: Université Montpellier II, France; Sobolev Institute of Mathematics, Novosibirsk, Russia

Abstract: This is a joint work with V. Kurlin. We develop the Dynnikov method of three-page embeddings for *links with singularities* of the following type: with possible double points of intersection in general position. Let SK be a semi-group with 15 generators from the alphabet $\mathbf{A} = \{a_i, b_i, c_i, d_i, x_i, i \in \mathbf{Z}_3\}$ and 84 relations:

- (1) $a_i = a_{i+1}d_{i-1}, \quad b_i = a_{i-1}c_{i+1}, \quad c_i = b_{i-1}c_{i+1}, \quad d_i = a_{i+1}c_{i-1},$
- (2) $x_i = d_{i+1}x_{i-1}b_{i+1},$
- (3) $d_1d_2d_3 = 1,$
- (4) $b_id_i = d_ib_i = 1,$
- (5) $d_ix_id_i = a_i(d_ix_id_i)c_i, \quad b_ix_ib_i = a_i(b_ix_ib_i)c_i,$
- (6) $x_i(d_{i+1}d_id_{i-1}) = (d_{i+1}d_id_{i-1})x_i,$
- (7) $(d_ic_i)w = w(d_ic_i),$ where $w \in \{c_{i+1}, x_{i+1}, b_id_{i+1}d_i\},$
- (8) $(a_ib_i)w = w(a_ib_i),$ where $w \in \{a_{i+1}, b_{i+1}, c_{i+1}, x_{i+1}, b_id_{i+1}d_i\},$
- (9) $t_iw = wt_i,$ where $t_i = b_{i+1}d_{i-1}d_{i+1}b_{i-1}, w \in \{a_i, b_i, c_i, x_i, b_{i-1}d_id_{i-1}\},$
- (10) $(d_ix_ib_i)w = w(d_ix_ib_i),$ where $w \in \{a_{i+1}, b_{i+1}, c_{i+1}, x_{i+1}, b_id_{i+1}d_i\}.$

Theorem 1. *Every singular knot can be represented by an element of the semi-group SK . Two singular knots are ambient isotopic if and only if the corresponding elements of SK are equal. An arbitrary element of SK corresponds to a singular knot if and only if this element is central, i.e. it commutes with every element of SK .*