

4-colored graphs and complements of knots and links*Michele Mulazzani**Department of Mathematics, University of Bologna, Bologna, Italy*

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A representation for compact 3-manifolds with non-empty non-spherical boundary via 4-colored graphs (i.e. regular 4-valent graphs endowed by a proper edge-coloration with four colors) has been introduced in [1], where an initial tabulation/classification of such manifolds has been obtained, up to 8 vertices of the representing graph.

Computer experiments show that the number of graphs/manifolds grows very rapidly with the increasing of the vertices. As a consequence we focused our attentions on the case of 3-manifolds which are the complements of knots or links in the 3-sphere. In this context we obtained the classification of these 3-manifolds, up to 12 vertices of the representing graphs, showing the type of the links involved (they are exactly 21, and among them 16 are prime).

For the particular case of knot complements, the classification has been recently extended up to 16 vertices: there are exactly 2 knot complements, the trivial knot complement (6 vertices) and the trefoil knot complement (16 vertices).

All these results are contained in [2], which will soon appear on the arXiv.

References

- [1] P. Cristofori, M. Mulazzani, Compact 3-manifolds via 4-colored graphs, RACSAM. *arXiv:1304.5070* (2015).
- [2] P. Cristofori, E. Fominykh, M. Mulazzani, V. Tarkaev, 4-colored graphs and knot/link complements. (2016) preprint.