

# TANGLE SUM AND CONSTRUCTIBLE SPHERES

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We discuss the relation between the combinatorial properties of cell decompositions of 3-spheres and the bridge index of knots contained in their 1-skeletons. The main result is to solve the conjecture of Ehrenborg and Hachimori which states that for a knot  $K$  in the 1-skeleton of a constructible 3-sphere satisfies  $e(K) \geq 2b(K)$ , where  $e(K)$  is the number of edges  $K$  consists of, and  $b(K)$  is the bridge index of  $K$ . The key tool is a sharp inequality of the bridge index of tangles in relation with tangle sum operation, which improves the primitive rough inequality used by Ehrenborg and Hachimori.

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