

The Buratti-Horak-Rosa Conjecture Holds for Some Underlying Sets of Size Three

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The Buratti-Horak-Rosa Conjecture concerns the possible multisets of edge-labels of a Hamiltonian path in the complete graph K_v with vertex labels $0, 1, \dots, v - 1$ and the induced *length* edge-labeling given by $\ell(x, y) = \min(|y - x|, v - |y - x|)$. The conjecture has been shown to hold when the underlying set of the multiset has size at most 2, for ten underlying sets of size 3 and for two of size 4. (Many partial results for other underlying sets are also known.) We use the method of growable realizations, which allows us to prove the conjecture for a given underlying set from a finite set of realizations with additional properties, to show that the Buratti-Horak-Rosa Conjecture holds for 27 further underlying sets of size 3. The known and new results include every underlying set of size 3 with largest element at most 7.

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