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*The Witsenhausen problem in dimension 3*

The orthogonality graph is the graph whose vertex set is the unit sphere in  $\mathbb{R}^3$ , in which two vectors are joined with an edge when they are orthogonal. Witsenhausen in 1974 asked for the largest possible fraction of the sphere which can be occupied by a Lebesgue measurable independent set in the orthogonality graph, and he gave the upper bound of  $1/3$ . We improve this upper bound to 0.313 using an approach inspired by the Delsarte bounds for codes, combined with some combinatorial reasoning. This represents the first progress on the Witsenhausen problem in dimension 3 since the original statement of the problem. Joint work with Oleg Pikhurko.