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Title: Actions of tame abelian product groups

Abstract: A Polish group G is tame if for any continuous action of G on a Polish space X , the induced orbit equivalence relation is Borel, as a subset of $X \times X$. Suppose that $G = \prod_n G_n$ is a product of countable abelian groups. It follows from results of Solecki and Ding and Gao that if G is tame, then all of its actions are in fact potentially \aleph_6^0 . Ding and Gao conjectured that this bound could be improved to \aleph_3^0 . We refute this, by finding an action of a tame abelian product group which is not potentially \aleph_5^0 . The proof involves forcing over models where the axiom of choice fails for sequences of finite sets.

This is joint work with Shaun Allison.