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Higher degree mixing out of the weak mixing

Abstract: The notion of weak mixing plays an important role in the structure theory of dynamical systems as well as in the applications to combinatorics and number theory. We shall review first the basic definitions and facts about various notions of mixing and then concentrate the discussion on properties of weakly mixing actions of various, not necessarily amenable groups. The main point that will be stressed is that weakly mixing actions of groups such as $\mathbf{Z} \times \mathbf{Z}$, $SL(2, \mathbf{Z})$, $SL(2, \mathbf{R})$ usually have much stronger mixing properties than one could expect.