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Measurable Hall's theorem for actions of abelian groups

I will discuss a measurable version of the Hall marriage theorem for actions of abelian groups. In particular, it implies that for free measure-preserving actions of such groups, if two equidistributed measurable sets are equidecomposable, then they are equidecomposable using measurable pieces. The latter generalizes a recent result of Grabowski, Máthé and Pikhurko on the measurable circle squaring and confirms a special case of a conjecture of Gardner. This is joint work with Tomasz Cieśla.