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Ergodic properties of randomly coloured point sets

In order to analyse properties of an aperiodically ordered point set such as the vertex set of the Penrose tiling, it has proven useful to consider the closure of the collection of all translates of the given point set, with respect to a suitable topology. In particular, there is a geometric characterisation of unique ergodicity in terms of uniform pattern frequencies for point sets of finite local complexity. We give such a characterisation within a generalised setup, where we allow for a uniformly discrete point set in a locally compact metric space with a continuous and proper action of a locally compact, second countable, unimodular group, which admits suitable averaging sequences. We will discuss applications of our setup to random colourings and graphs. This is joint work with Peter Müller, Munich, see also http://arxiv.org/pdf/1005.4884.