

Rigid Moieties of Relational Homogeneous Structures

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Abstract

Given a countable set X , a *moiety* of X is a subset which is countable and co-countable. A *rigid* embedding of a structure M into a structure N is an embedding where each automorphism of M extends uniquely to an automorphism of N .

Definition 0.1. Let \mathcal{K} be a free amalgamation class in a finite relational language \mathcal{L} and let \mathbf{K} be its Fraïssé limit. Assume that for each $R_i \in \mathcal{L}$ and each $x_1, x_2, \dots, x_{l_i} \in \mathbf{K}$, if $R_i(x_1, x_2, \dots, x_{l_i})$, then $x_1 = x_2 = \dots = x_{l_i}$. Then \mathcal{K} is called *totally disconnected*.

Theorem 0.2. *Let \mathcal{K} be a not totally disconnected free amalgamation class in a finite relational language \mathcal{L} and assume that all the one-point sets in \mathcal{K} are isomorphic. Then every countably infinite \mathcal{L} -structure K , whose age lies in \mathcal{K} , can be embedded as a rigid moiety into the Fraïssé limit of \mathcal{K} . Moreover, there are 2^ω many such embeddings which are not conjugate in $\text{Aut}(\mathbf{K})$.*

This theorem almost fully classifies the existence of rigid moieties among free amalgamation classes.

Keywords: Rigid Embedding, Moiety, Free Amalgamation, Fraïssé limit.