

On finite homomorphism-homogeneous binary relational systems

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A structure is called homogeneous if every isomorphism between finite substructures of the structure extends to an automorphism of the structure. Recently, P. J. Cameron and J. Nešetřil introduced a relaxed version of homogeneity: we say that a structure is homomorphism-homogeneous if every homomorphism between finitely induced substructures of the structure extends to an endomorphism of the structure.

In this talk we classify homomorphism-homogeneous finite reflexive binary relational systems. The classification naturally splits into several cases. In some cases we provide a complete characterization, while in each of the remaining cases we show that deciding whether such a relational system is homomorphism-homogeneous is a *coNP*-complete problem. Intuitively, this means that in those remaining cases we cannot hope for a reasonable catalogue.

This is a joint work with D. MAŠULOVIĆ and N. ŠKORIĆ (University of Novi Sad).