

INDEPENDENCE RELATIONS IN ABSTRACT ELEMENTARY CATEGORIES

MARK KAMSMA

In Shelah's classification of first-order theories we classify theories using combinatorial properties. The most well-known class is that of stable theories, which are very well-behaved. Simple theories are more general, and then even more general are the $NSOP_1$ theories. We can characterise those classes by the existence of a certain independence relation. For example, in vector spaces such an independence relation comes from linear independence. Part of this characterisation is canonicity of the independence relation: there can be at most one nice enough independence relation in a theory.

Lieberman, Rosický and Vasey proved canonicity of stable-like independence relations in accessible categories. Inspired by this we introduce the framework of AECats (abstract elementary categories) and prove canonicity for simple-like and $NSOP_1$ -like independence relations. This way we reconstruct part of the hierarchy that we have for first-order theories, but now in the very general category-theoretic setting.