Prime Maltsev conditions and compatible digraphs Miklós Maróti (mmaroti@math.u-szeged.hu) University of Szeged

In 1984 Garcia and Taylor initiated a systematic study of Maltsev conditions, certain sets of identities used to describe classes of varieties of similar behavior, and introduced the lattice of interpretability types of varieties. One of the main questions investigated is what classical Maltsev conditions determine a prime filter in this lattice. Prime filters identify properties of varieties that are not implied by any two strictly weaker conditions and thus can be considered as the most fundamental properties of varieties. We have recently proved that Taylor varieties and Hobby-McKenzie varieties form prime filters.

Using the developed tools we can characterize these varieties by their compatible reflexive digraphs. A relational structure \mathbb{G} is compatible with a variety if the variety has an algebra \mathbf{A} on the same universe as that of \mathbb{G} and all relations of \mathbb{G} are subpowers of \mathbf{A} . We prove that a variety has a Taylor term if and only if all reflexive, antisymmetric compatible digraphs are cycle-free. We also show that a variety has Hobby-McKenzie terms if and only if in all reflexive compatible digraphs strongly connected elements are also extremely connected (with back and forth edges).