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Quotients and equations

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Quotients are ubiquitous in Mathematics, and a general question is whether a certain category of sets allows quotients. For the category of definable sets in a given structure, the model theoretic approach is called elimination of imaginaries. For algebraically closed fields, Chevalley's theorem and the existence of a field of definition of a variety imply that a quotient of a Zariski constructible set by a Zariski constructible equivalence relation is again constructible. Similar results hold for other classes of fields, such as differentially closed fields. In this talk, we will focus on separably closed fields and differentially closed fields of positive characteristic. In joint work with Martin Ziegler, we will provide a natural expansion of the language to achieve elimination of imaginaries, by showing that these theories are equational. Equationality, introduced by Srour, and later considered by Srour and Pillay, is a generalisation of local noetherianity. We will present the main ideas of the proof, without assuming a deep knowledge of model theory.

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