

MODEL THEORY OF GALOIS ACTIONS

Piotr Kowalski

University of Wrocław (Wrocław, Poland)

For a fixed finitely generated group G , we consider actions of G by field automorphisms. We are interested in the following problem: what are possible algebraic conditions on the group G which imply that the class of *existentially closed* fields with G -actions is axiomatizable. A field with a G -action is existentially closed, if all solvable (in an extension) systems of G -polynomial equations are already solvable in this given field with a G -action. If the above class is axiomatizable, then we say that the theory G -TCF exists. It is well-known that G -TCF exists if G is a free group (the theory ACFA), and it is also known that G -TCF exists for a finite G . On the other hand, Hrushovski has shown that $(\mathbb{Z} \times \mathbb{Z})$ -TCF does not exist.

Using Bass-Serre theory, we prove that if G is finitely generated and virtually free, then G -TCF exists generalizing the existing results about free groups and finite groups. We also specify how the theories G -TCF we have obtained fit into the neo-stability hierarchy.

This is joint work with Özlem Beyarslan