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Invariant Queries

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Given a sentence ϕ in first-order logic over a vocabulary $S = S_1 \cup S_2$, it may be that ϕ does not depend on the S_2 structure at all. If this so, we imagine that S_2 can be removed from ϕ . This is the question I'll deal with—under what cases can we eliminate invariant structure? You can look at this for many possibilities of S_2 —e.g., a supplementary pairing function, a linear order, a partial order. I'll talk about this question either in relation to questions in definable model theory on the reals (joint work with Jan Van den Bussche, Christoph Loeding, and Thomas Wilke) or in relation to questions in finite model theory (joint work with Luc Segoufin).