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The Model Theory of Continua

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Abstract

Model theory provides an excellent conceptual platform for examining (classes of) algebraic objects. Somewhat less straightforwardly, but just as elegantly, it can be used as a conceptual platform in topology. Our long-term study applies model-theoretic (mainly ultraproduct) methods to create conjectures and prove theorems about compacta (notably continua) and the maps between them. One payoff of this study has been the identification of the class of *co-existentially closed continua*, a subclass of the class of unidimensional indecomposable continua. Every continuous surjection from a continuum onto a co-existentially closed continuum is weakly confluent, so our new class is contained in Lelek's class W. What is more, from the standpoint of category duality, this class bears the same relationship to the class of continua as the class of algebraically closed fields does to the class of fields; and one of many open questions is whether every unidimensional indecomposable continuum is co-existentially closed.