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Weakly o-minimal structures

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A linearly ordered structure M is weakly o-minimal if every definable subset of M can be written as a finite union of convex sets. We will discuss the theory that has been developed around these structures analogous to that of o-minimal structures, in the paper “Weakly o-minimal structures and real closed fields” by Macpherson, Marker and Steinhorn. The main result shows that every weakly o-minimal ordered field is real closed. We will look at some natural examples of weakly o-minimal structures and a local form of the monotonicity theorem proven by Arefiev which holds here.