Definable Versions of Menger's Conjecture

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Menger's conjecture that Menger spaces are σ-compact has been refuted in ZFC. However, the question of whether it holds for spaces that are "definable" in some sense remains of interest. Hurewicz proved it for completely metrizable and indeed for analytic metrizable spaces; Arhangel'skiĭ proved it for analytic spaces in general. We prove it for Čech-complete spaces. It was known to be undecidable for co-analytic sets of reals; we extend this to co-analytic topological groups. A more general class of spaces than the analytic ones are the K-analytic spaces studied by Frolík and by Rogers and Jayne. Among the many results we prove, let us mention that Menger K-analytic spaces need not be σ-compact, but that they satisfy the weaker Hurewicz property.

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