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Lipschitzian retracts and curves as invariant sets. (English summary)

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An invariant set in a metric space (X, d) is a non-empty compact set $K \subseteq X$ such that $K = \bigcup_{i=1}^{n} T_i(K)$ for some contractions $T_1, T_2, \ldots, T_n : X \to X$. The authors prove that the range $\Gamma([\alpha, \beta])$ of any rectifiable curve $\Gamma : [\alpha, \beta] \to X$ is an invariant set, and they provide an example of a simple arc (in fact the graph of a continuous function) which is not an invariant set. They also prove that the union of finitely many invariant sets is an invariant set, provided that the sets are weak Lipschitzian retracts of the space X. In the case when $X = \mathbb{R}^N$ and the sets are compact weak Lipschitzian retracts of the space with at least one of them having non-empty interior, their union is an invariant set (even though the sets themselves do not have to be invariant).

Reviewed by *Radu Miculescu*