

Metric and Geometric Relaxations of Self-Contracted Curves

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© 2018, Springer Science+Business Media, LLC, part of Springer Nature. The metric notion of a self-contracted curve (respectively, self-expanded curve, if we reverse the orientation) is hereby extended in a natural way. Two new classes of curves arise from this extension, both depending on a parameter, a specific value of which corresponds to the class of self-expanded curves. The first class is obtained via a straightforward metric generalization of the metric inequality that defines self-expandedness, while the second one is based on the (weaker) geometric notion of the so-called cone property (eel-curve). In this work, we show that these two classes are different; in particular, curves from these two classes may have different asymptotic behavior. We also study rectifiability of these curves in the Euclidean space, with emphasis in the planar case.