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# Hölder Exponents on Metric Spaces using Morphological Operators

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## Résumé

In this work, we are interested in the study of the local and global regularity of a class of functions which are relevant in fractal analysis, the so-called Hölder continuous functions. Indeed, fractal dimension and Hölder exponent of functions are related in many cases. Estimates of the dimension or the exponent of this kind of functions are classically based either on wavelet theory or on multiscale morphological operators. In this contribution, Hölder function characterization is revisited from the mathematical morphology viewpoint, including the connection with some contributions from the field of max-plus mathematics. We show in particular that morphological operators on metric spaces are naturally formulated in the case of Hölder continuous functions. We focus on the case of morphological semigroups on length spaces since they provide the natural extension of multiscale morphological operators on the Euclidean space. We prove how these semigroups can be used to characterize the exponent of Hölder functions on length spaces.

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