1099-42-219   **Ji Li*** (`ji.li@mq.edu.au`), Department of Mathematics, Macquarie University, North Ryde, NSW 2109, Australia. *Hardy space theory on spaces of homogeneous type in the sense of Coifman and Weiss via orthonormal wavelet bases.*

Spaces of homogeneous type (X, d, μ) were introduced by Coifman and Weiss in the early 1970s. However, for some applications, additional assumptions were imposed, because the quasi-metric d may have no regularity and quasi-metric balls may not be open.

Using the remarkable orthonormal wavelet basis constructed recently by Auscher and Hytönen, we establish the theory of product Hardy spaces on spaces $\widetilde{X} = X_1 \times X_2 \times \cdots \times X_n$, where each factor X_i is a space of homogeneous type in the sense of Coifman and Weiss. The main tool we develop is the Littlewood–Paley theory on $\widetilde{X}$, which in turn is a consequence of a corresponding theory on each factor space.

We make no additional assumptions on the quasi-metrics or the doubling measures, and thus we extend to the full generality of product spaces of homogeneous type the aspects of both one-parameter and multiparameter theory involving the Littlewood–Paley theory and function spaces. Moreover, we expect our methods to be a powerful tool for developing function spaces and the boundedness of singular integrals on spaces of homogeneous type. See also the related talk by Lesley Ward in this session.

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