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The authors generalize two results on maps and functions with bounded mean oscillation (BMO maps and BMO functions) to the context of complete metric spaces $X$ equipped with outer measures satisfying the doubling condition (that is, for which the outer measure of an open ball is bounded by a constant multiple of the outer measure of the open ball centered at the same point and of halved radius). The first of them asserts that under certain conditions on a finite system of measurable sets $E_1, \ldots, E_N$ there exists a partition of unity $f_1, \ldots, f_N$ formed by BMO nonnegative functions such that $f_j$ vanishes almost everywhere on $E_j$ ($j = 1, \ldots, N$). The second gives sufficient and necessary conditions (which relate the outer measures of pairs of measurable sets and their inverse images) for a measurable map $F$ of $X$ into $X$ to be a BMO map (that is, such that $u \circ F$ is BMO for any real-valued BMO function $u$ on $X$) and estimates the norm of the corresponding composition operator.

The proofs of the aforementioned results are constituted by a number of auxiliary results.

Reviewer: Piotr Niemiec (Kraków)

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