

## Poincaré inequalities for the maximal function

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**Abstract.** We study generalized Poincaré inequalities. We prove that if a function satisfies an inequality of Poincaré type, then the Hardy-Littlewood maximal function also obeys an estimate of similar form. As a by-product, we get a unified approach to proving that the maximal operator is bounded on Sobolev, Lipschitz and BMO spaces.

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