Strong $A_{\infty}$ weights and Sobolev capacities in metric measure spaces

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Abstract. We study strong $A_{\infty}$ weights in Ahlfors $Q$-regular and geodesic metric spaces satisfying a weak $(1, s)$-Poincaré inequality for some $s$ such that $1 < s \leq Q < \infty$. It is shown that whenever $\max(1, Q - 1) < s \leq Q$, a function $u$ yields a strong $A_{\infty}$ weight of the form $w = e^{Qu}$ if $u$ has a minimal $s$-weak upper gradient with sufficiently small Morrey norm.