POINCARÉ INEQUALITIES AND A GENERAL QUASIHYPERBOLIC GROWTH CONDITION

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Abstract. We study the validity of Poincaré inequalities in bounded domains where a generalized quasihyperbolic growth condition holds. We give a condition for the general growth condition that guarantees that the bounded domain is (q, n)-Poincaré domain for certain values of $q \geq n$. This is a generalization of the result of Koskela and Lehrbäck [Thm 3.4 in Quasihyperbolic boundary conditions and compact embeddings of Sobolev spaces (Michigan Math. J. 55 (2007))]. We also give an example of a bounded domain that is not a $(1, p)$-Poincaré domain for any $p < n$, and the quasihyperbolic metric satisfies a growth condition that grows just a little faster than logarithm.

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