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The Poincaré inequality in uniform domains

We consider a uniform domain in Euclidean space. The central question in this talk is to establish a local Poincaré inequality, that is to say, to estimate the p-average of the oscillation of a function on some ball by the p-average of its gradient on a ball with the same center but with a radius that is a (fixed) multiple of the original radius. Our motivation for this investigation are p-bounds for Riesz transforms associated with a non-smooth elliptic operator in divergence form. Our approach is based on a Sobolev extension operator that has homogeneous and local estimates. The construction is derived from similar ideas by P. W. Jones.