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On the Tauberian condition for geometric maximal operators

It is shown that if a maximal operator associated with a homothety invariant collection of convex sets R^n satisfies Cordoba-Fefferman Tauberian condition at some fixed level, then it must satisfy the same condition at all levels and moreover the maximal operator is L^p – *bounded* for sufficiently large p . As a corollary of these results it is shown that any density basis that is a homothety invariant collection of convex sets in R^n must differentiate integrals of the functions from L^p for sufficiently large p . This is a joint result with Paul Hagelstein.