1030-42-130 **Paul Alton Hagelstein*** (paul_hagelstein@baylor.edu), Department of Mathematics, Baylor University, Waco, TX 76798, and **Alexander Stokolos** (astokolo@math.depaul.edu), Department of Mathematics, De Paul University, Chicago, IL 60614. *Tauberian conditions for geometric maximal operators.*

Let $\mathcal{B}$ be a collection of measurable sets in $\mathbb{R}^n$. The associated geometric maximal operator $M_{\mathcal{B}}$ is defined on $L^1(\mathbb{R}^n)$ by $M_{\mathcal{B}}f(x) = \sup_{x \in R \in \mathcal{B}} \frac{1}{|R|}\int_R |f|$. If $\alpha > 0$, $M_{\mathcal{B}}$ is said to satisfy a *Tauberian condition with respect to* α if there exists a finite constant C such that for all measurable sets $E \subset \mathbb{R}^n$ the inequality $|\{x : M_{\mathcal{B}}\chi_E(x) > \alpha\}| \leq C|E|$ holds. It is shown that if $\mathcal{B}$ is a homothecy invariant collection of convex sets in $\mathbb{R}^n$ and the associated maximal operator $M_{\mathcal{B}}$ satisfies a Tauberian condition with respect to some $0 < \alpha < 1$, then $M_{\mathcal{B}}$ must satisfy a Tauberian condition with respect to γ for all $\gamma > 0$ and moreover $M_{\mathcal{B}}$ is bounded on $L^p(\mathbb{R}^n)$ for sufficiently large p. As a corollary of these results it is shown that any density basis that is a homothecy invariant collection of convex sets in $\mathbb{R}^n$ must differentiate $L^p(\mathbb{R}^n)$ for sufficiently large p. (Received July 27, 2007)