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Exceptional Sets in Convex Domains

Assume that Ω is a strongly convex domain, balanced with boundary of class C^1 . Fix number $p \geq 1$. For any set E which is circular and of type G_δ in $\partial\Omega$ we find a holomorphic function $f \in \mathcal{O}(\Omega)$ such that

$$E = E_\Omega^p(f) = \left\{ z \in \partial\Omega : \int_{|\lambda|<1} |f(\lambda z)|^p d\mathcal{L}^2(\lambda) = \infty \right\}.$$

Keywords: Boundary behavior of holomorphic functions, exceptional sets, power series, computed tomography.

MSC: 30B30; 30E25