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Peak Set Crossing all the Circles

Let $\Omega \subset \mathbb{C}^d$ be a circular, bounded, strictly convex domain with C^2 boundary. We construct a peak set $K \subset \partial\Omega$ which intersects all the circles in $\partial\Omega$ with the center at zero. In particular Hausdorff dimension of K is at least $2d - 2$.

Keywords: Homogeneous polynomials, peak set, maximum modulus set, inner function.

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