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Around L^1 (un)boundedness of Szegö projections on CR manifolds of hypersurface type

Abstract

The Szegö projection, namely the orthogonal projection onto the space of square-integrable CR functions, may be defined on any abstract CR manifold equipped with a smooth positive measure. Thanks to works of E. Stein and many coauthors, it is known that for various classes of smooth pseudoconvex domains in $\mathbb{C}^n$, the associated Szegö projections admit a bounded extension to L^p if and only if $1 < p < +\infty$. In particular, L^1 unboundedness is a typical and expected phenomenon. We show that this is not anymore the case when we move to the realm of abstract CR structures and that, in the real analytic category, L^1 boundedness of Szegö projections is neatly related with the notion of Levi-flatness.