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On unitary invariants of quotient Hilbert modules Along smooth complex analytic sets.
(English) [Zbl 07352611]

Summary: Let $\Omega \subset \mathbb{C}^m$ be an open, connected and bounded set and $\mathcal{A}(\Omega)$ be a function algebra of holomorphic functions on $\Omega$. Suppose that $\mathcal{M}$ is a reproducing kernel Hilbert module over $\mathcal{A}(\Omega)$. In this article, we first obtain a model for the quotient Hilbert modules obtained from submodules of functions in $\mathcal{M}$ vanishing to order $k$ along a smooth irreducible complex analytic set $Z \subset \Omega$ of codimension at least 2, assuming that the Hilbert module $\mathcal{M}$ is in the Cowen-Douglas class over $\Omega$. This model is used to show that such a quotient module happens to be in the Cowen-Douglas class over $Z \cap \Omega$ which then enables us to determine unitary equivalence classes of the aforementioned quotient modules in terms of the geometric invariants of hermitian holomorphic vector bundles. As an application, we obtain that unitary equivalence classes of a large family of these Hilbert modules are completely determined by those of certain quotient modules of the above kind.

MSC:
47B13 Cowen-Douglas operators
46E22 Hilbert spaces with reproducing kernels (= (proper) functional Hilbert spaces, including de Branges-Rovnyak and other structured spaces)
47B32 Linear operators in reproducing-kernel Hilbert spaces (including de Branges, de Branges-Rovnyak, and other structured spaces)
32A60 Zero sets of holomorphic functions of several complex variables
32Q35 Complex manifolds as subdomains of Euclidean space
53C07 Special connections and metrics on vector bundles (Hermite-Einstein, Yang-Mills)

Keywords:
Hilbert modules; quotient module; Cowen-Douglas operator; jet bundles; curvature

Full Text: DOI

References:


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