
RAUL CURTO, University of Iowa

A New Necessary Condition for the Hyponormality of Toeplitz Operators on the Bergman Space

A well known result of C. Cowen states that, for a symbol $\varphi \in L^\infty$, $\varphi \equiv \bar{f} + g$ ($f, g \in H^2$), the Toeplitz operator T_φ acting on the Hardy space of the unit circle is hyponormal if and only if $f = c + T_{\bar{h}}g$, for some $c \in \mathbb{C}$, $h \in H^\infty$, $\|h\|_\infty \leq 1$. In this talk we consider possible versions of this result in the Bergman space case. Concretely, we consider Toeplitz operators on the Bergman space of the unit disk, with symbols of the form

$$\varphi \equiv \alpha z^n + \beta z^m + \gamma \bar{z}^p + \delta \bar{z}^q,$$

where $\alpha, \beta, \gamma, \delta \in \mathbb{C}$ and $m, n, p, q \in \mathbb{Z}_+$, $m < n$ and $p < q$. By studying the asymptotic behavior of the action of T_φ on a particular sequence of vectors, we obtain a sharp inequality involving the above mentioned data. This inequality improves a number of existing results, and it is intended to be a precursor of basic necessary conditions for joint hyponormality of tuples of Toeplitz operators acting on Bergman spaces in one or several complex variables.