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Hankel operators and the Dixmier trace

We discuss the membership of (big) Hankel operators H_f on weighted Bergman spaces in the Dixmier class. For the unit disc and f holomorphic, $H_{\overline{f}}$ is in this class if and only if f' belongs to the Hardy one-space H^1. On the unit ball in $\mathbf{C}^n$, $n \geq 2$, there is an analogous result for any f smooth on the closed ball (not necessarily conjugate-holomorphic), which is reminiscent of the trace formula of Helton and Howe. The last result extends also to arbitrary smoothly bounded strictly pseudoconvex domains in $\mathbf{C}^n$, where the formula for the Dixmier trace turns out to involve the Levi form, thus exhibiting an interesting link with the geometry of the domain. The proofs involve analysis of pseudodifferential operators on the boundary of the domains.

The case of the disc is joint work with Richard Rochberg, while the case of the ball and of pseudoconvex domains are joint with Kunyu Guo and Genkai Zhang.