Subnormal Toeplitz operators and Abrahamse's theorem

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In this paper we give a connection between subnormal Toeplitz operators and the kernels of the self-commutators. This is closely related to P.R. Halmos's Problem 5: *Is every subnormal Toeplitz operator either normal or analytic?* Our main theorem is an improvement of the Abrahamse's theorem [Ab] concerning P.R. Halmos's Problem 5. It is shown that if $\varphi = \bar{g} + f \in L^\infty$ $(f, g \in H^2)$ is such that $\bar{f}$ and $\bar{g}$ are of bounded type (that is, they are quotients of two analytic functions on the open unit disk) and if the kernel of the self-commutator of T_φ is invariant for T_φ then T_φ is either normal or analytic.

References

[Ab]   M.B. Abrahamse, *Sunormal Toeplitz operators and functions of bounded type*, Duke Math. J. **43** (1976), 597–604.