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Estimates for the Szegő kernel and the $\bar{\partial}_b$ equation

We can consider the Szegő kernel $S(z, \zeta)$ on the boundary of model domains $\Omega = \{(z_1, z_2) \in \mathbb{C}^2 \mid -\Im z_2 > b(\Re z_1)\}$. If b is convex, the only singularities of $S(z, \zeta)$ are on the diagonal $z = \zeta$. When the function b is a certain non-convex function, we show that near certain points, there are singularities off the diagonal.

We will then discuss some recent work on a related problem, the $\bar{\partial}_b$ problem for the model domain considered above.

This is joint work with Jennifer Halfpap.