A finer limit circle/limit point classification for trace class Sturm-Liouville operators

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In this talk we study an index $\ell \in \mathbb{N}_0 \cup \{+\infty\}$ associated to the endpoints of nonoscillatory Sturm–Liouville differential expressions with trace class resolvents. This notion extends the limit circle/limit point dichotomy in the sense that $\ell = 0$ at some endpoint if and only if the expression is in the limit circle case. In the limit point case $\ell > 0$, we present a natural interpretation of ℓ in terms of iterated Darboux transforms. We also show stability of the index ℓ for a suitable class of perturbations, extending earlier work on perturbations of spherical Schrödinger operators to the case of general three terms Sturm–Liouville operators.
This is joint work with Jonathan Stanfill from Ohio State University.