

TEMPLE UNIVERSITY

Department of Mathematics

Analysis Seminar

Room 617 Wachman Hall

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Spectral instability of selfadjoint extensions

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Abstract: The family of selfadjoint extensions of certain differential operators (elliptic semibounded cone operators on a compact manifold) initially defined on compactly supported functions can be parametrized by the elements of a real analytic finite-dimensional manifold $\mathfrak{S}\mathfrak{A}$ depending on A , the domain of the Friedrichs extension being one particular element. Let A be one such operator, assume that $\mathfrak{S}\mathfrak{A}$ contains more than one element. The spectrum of A with any domain $\mathcal{D} \in \mathfrak{S}\mathfrak{A}$ is bounded below, but there exist domains $\mathcal{D}_0 \in \mathfrak{S}\mathfrak{A}$ which admit a neighborhood $U \subset \mathfrak{S}\mathfrak{A}$ for which the property $\forall \zeta \in \mathbb{R} \exists \mathcal{D} \in U$ s.t. $\inf \text{spec}(A_{\mathcal{D}}) < \zeta$ holds. The set of such spectrally unstable domains is a codimension 1 (real-)analytic variety in $\mathfrak{S}\mathfrak{A}$ which will be described explicitly.