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Title: Spectral shift and trace inequalities.

Abstract: In the standard perturbation theory setting, Krein's and Koplienko's spectral shift functions describe how the spectrum of a function of a self-adjoint operator changes under a trace class (or possibly a Hilbert-Schmidt) perturbation. Perturbations with non-trivial essential spectra can be handled by passing to a general semi-finite von Neumann algebra setting. An available tool for treating relative trace class perturbations is a semi-finite von Neumann algebra analog of Krein's spectral shift function. We complement this tool by a semi-finite von Neumann algebra analog of Koplienko's spectral shift function. As an application of the spectral shift function theory, we derive monotonicity and convexity inequalities for operator functions inside a normal faithful semi-finite trace. The planned talk is based on joint work with K.A. Makarov.