Abstract: We give global criteria for the canonical reductions of an unnecessary self-adjoint operator on a complex separable Hilbert space. These criteria are obtained by an extension of the Poincaré separation theorem for the eigenvalues of a Hermitian matrix. We derive extremal properties of the singular values of a compact operator, thus generalizing known results in finite dimension (cf. [3], [10], [11]) and the recent results by Gohberg and Krejn [7]. Our goal is to find criteria for the factor analysis of a probability defined on a separable Hilbert space or of a real random function other than a finite or countable set of real random variables.

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