

A generalization of the Fekete–Szegő functional to Banach spaces and its properties

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Abstract

We introduce the Fekete–Szegő type operator in the open unit ball of a complex Banach space and study its geometric and analytic properties. All the modifications of the Fekete–Szegő functional studied before are either projections or particular cases of the operator we introduce.

We investigate the connection of the Fekete–Szegő type operator with composition and inverting of mappings, generalized n -th root transform, as well as the unitary transform of mappings.

Also, we show that for a given mapping f , the Fréchet derivative of third order of the inverse mapping f^{-1} and of elements of the semigroup generated by f can be expressed by the Fekete–Szegő operator.

Based on the join work with Mark Elin.

Dedicated to the memory of Professor Gabriela Kohr.