CALDERON-TYPE THEOREM FOR OPERATORS WITH NONSTANDARD ENDPOINT BEHAVIOUR

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The fundamental interpolation theorem of Calderon states that a quasilinear operator bounded from a Lorentz endpoint space into a Marcinkiewicz interpolation space is bounded from a given rearrangement-invariant space into another one if and only if an appropriate one-dimensional integral operator is bounded between their respective representation spaces. We establish a Calderon-type theorem for operators, whose behaviour at one of the endpoints endpoint can be described by boundedness either between two Marcinkiewicz spaces or between two Lorentz spaces. We apply the results obtained to sharp Sobolev embeddings and to boundary trace embeddings and to new inequalities involving the fractional maximal operator. This is a joint work with Amiran Gogatishvili.

OPERATOR EXTENSIONS OF PARALLELOGRAM LAW

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A general operator parallelogram law concerning a characterization of inner product spaces is established and an operator extension of Bohr's inequality as well as several norm inequalities are presented. More precisely, let $\mathfrak{A}$ be a C^*-algebra, T be a locally compact Hausdorff space equipped with a Radon measure μ and let $(A_t)_{t\in T}$ be a continuous field of operators in $\mathfrak{A}$ such that the function $t \mapsto A_t$ is norm continuous on T and the function $t \mapsto \|A_t\|$ is integrable. Let $\alpha : T \times T \to \mathbb{C}$ be a measurable function such that $\overline{\alpha(t,s)}\alpha(s,t) = 1$ for all $t, s \in T$. Then

$$\int_T\int_T\left|\alpha(t,s)A_t-\alpha(s,t)A_s\right|^2 d\mu(t)d\mu(s)+\int_T\int_T\left|\alpha(t,s)B_t-\alpha(s,t)B_s\right|^2 d\mu(t)d\mu(s)$$
$$=2\int_T\int_T\left|\alpha(t,s)A_t-\alpha(s,t)B_s\right|^2 d\mu(t)d\mu(s)-2\left|\int_T(A_t-B_t)d\mu(t)\right|^2.$$

EULER INTEGRAL IDENTITIES AND CHEBYSHEV SYSTEMS

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