

**Title:** Optimal pairs of function spaces for weighted Hardy operators

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**Abstrakt:** We focus on a certain weighted Hardy operator, with a continuous, quasi-concave weight, defined on a rearrangement-invariant Banach function spaces. The operators of Hardy type are of great use to the theory of function spaces. The mentioned operator is a more general version of the Hardy operator, whose boundedness was shown to be equivalent to a Sobolev-type embedding inequality. This thesis is concerned with the proof of existence of domain and range spaces of our Hardy operator that are optimal. This optimality should lead to the optimality in the Sobolev-type embedding equalities. Our another aim is to study supremum operators, which are also closely related to this issue, and establish some of their basic properties.

**Keywords:** optimality, weighted Hardy operator, supremum operator