

REFeree'S REPORT
on the PhD Thesis
"Integral and Supremal Operators
on Weighted Function Spaces"
by Martin Křepela

This dissertation is devoted to boundedness of integral and supremal operators between classical function spaces (Lebesgue, Lorentz) with weights. The main goal of this work is the characterization of Hardy-type and convolution inequalities in terms of weights as well as their applications to embedding theorems.

Generally speaking, this topic has been intensively studied for the last 100 years and it has received a lot of attention during the last 15 years.

The thesis consists of the introduction, the summary (with basic notations, brief description of scientific content, and references used in the summary), and 9 original papers.

The first part includes the papers I, II, III, and IX and studies the Young–O'Neil convolution inequalities. The second part covers the Hardy inequality for bilinear weighted (Hardy) operators on monotone functions (papers IV and V). The third one consists of papers VI, VII, and VIII and deals with supremal Hardy-type inequalities. The author successfully solved all mentioned above problems. The results are given either in form of equivalences or optimal conditions.

I especially would like to emphasize two important points that I think are of considerable interest. The first one is a nice application of the blocking technique when the author deals with supremal operators. The second one is the optimality of the main results while the author studies the convolution inequalities. More precisely, the author found an optimal r.i. lattice such that the given Young–O'Neil-type inequality holds.

Overall, I find the topic of the thesis interesting and well motivated. The thesis is well-written. The results obtained are original and new. I think that the results will be surely of considerable interest to specialists working in the fields of function spaces and integral operators.

I conclude that the submitted work "Integral and Supremal Operators on Weighted Function Spaces" fulfills the requirements for the PhD Thesis and recommend to award the PhD degree to Martin Křepela.



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