



Banach J. Math. Anal. 2 (2008), no. 2, 9–15

**BANACH JOURNAL OF MATHEMATICAL ANALYSIS**

ISSN: 1735-8787 (electronic)

<http://www.math-analysis.org>

## HARDY INEQUALITY OF FRACTIONAL ORDER

PETR GURKA<sup>1</sup> AND BOHUMÍR OPIC<sup>2\*</sup>

*This paper is dedicated to Professor Josip E. Pečarić*

Submitted by M. Abel

ABSTRACT. We prove optimality of power-type weights in the Hardy inequality of fractional order.

<sup>1</sup> DEPARTMENT OF MATHEMATICS, CZECH UNIVERSITY OF AGRICULTURE, 165 21 PRAGUE 6, CZECH REPUBLIC.

*E-mail address:* [gurka@tf.czu.cz](mailto:gurka@tf.czu.cz)

<sup>2</sup> MATHEMATICAL INSTITUTE, ACADEMY OF SCIENCES OF THE CZECH REPUBLIC, ŽITNÁ 25, 115 67 PRAGUE 1, CZECH REPUBLIC;

DEPARTMENT OF MATHEMATICS AND DIDACTICS OF MATHEMATICS, PEDAGOGICAL FACULTY, TECHNICAL UNIVERSITY OF LIBEREC, HÁLKOVA 6, 46117 LIBEREC, CZECH REPUBLIC.

*E-mail address:* [opic@math.cas.cz](mailto:opic@math.cas.cz)

---

*Date:* Received: 29 February 2008; Accepted: 25 March 2008.

\* Corresponding author.

2000 *Mathematics Subject Classification.* 26D10.

*Key words and phrases.* Hardy inequality of fractional order, power-type weights.

The research was partly supported by grant no. 201/05/2033 of the Grant Agency of the Czech Republic and by the Institutional Research Plan no. AV0Z10190503 of the Academy of Sciences of the Czech Republic.