Annals of Functional Analysis

Ann. Funct. Anal. 2 (2011), no. 1, 72–83
ANNALS OF FUNCTIONAL ANALYSIS
ISSN: 2008-8752 (electronic)
URL: www.emis.de/journals/AFA/

REFINEMENTS OF HÖLDER'S INEQUALITY DERIVED FROM FUNCTIONS $\psi_{p,q,\lambda}$ AND $\phi_{p,q,\lambda}$

LUDMILA NIKOLOVA[1] AND SANJA VAROŠANEC[2*]

Communicated by C. P. Niculescu

ABSTRACT. We investigate a convex function $\psi_{p,q,\lambda} = \max\{\psi_p, \lambda\psi_q\}$, $(1 \leq q < p \leq \infty)$, and its corresponding absolute normalized norm $\|.\|_{\psi_{p,q,\lambda}}$. We determine a dual norm and use it for getting refinements of the classical Hölder inequality. Also, we consider a related concave function $\phi_{p,q,\lambda} = \min\{\psi_p, \lambda\psi_q\}$, $(0 < p < q \leq 1)$.

[1] DEPARTMENT OF MATHEMATICS AND INFORMATICS, SOFIA UNIVERSITY, SOFIA, BULGARIA.
E-mail address: ludmilan@fmi.uni-sofia.bg

[2]DEPARTMENT OF MATHEMATICS, UNIVERSITY OF ZAGREB, ZAGREB, CROATIA.
E-mail address: varosans@math.hr

Date: Received: 26 March 2011; Accepted: 8 April 2011.
* Corresponding author.
2010 *Mathematics Subject Classification.* Primary 46B20; Secondary 46B99, 26D15.
Key words and phrases. Hölder's inequality, absolute normalized norm, concave function, $\psi_{p,q,\lambda}$ function.