# Refinements of Hilbert's Inequality Involving the Laplace Transform\*

## Josip Pečarić<sup>†</sup>

Faculty of Textile Technology, University of Zagreb, Pierottijeva 6, 10000 Zagreb, Croatia

### Ivan Perić<sup>‡</sup>

Faculty of Food Technology and Biotechnology, University of Zagreb, Pierottijeva 6, 10000 Zagreb, Croatia

#### and

## Predrag Vuković§

Teacher Training College Čakovec, Ante Starčevića 55, 40000 Čakovec, Croatia

Received July 4, 2007, Accepted August 1, 2008.

#### Abstract

In this paper generalizations of Peachey's results which refine some known Hilbert's inequalities in the sense that they interpolate Lebesgue norms of the Laplace transforms of the functions involved in the inequalities are obtained. Cases of conjugate and non-conjugate exponents are considered.

<sup>\*2000</sup> Mathematics Subject Classification. 26D15.

<sup>†</sup>E-mail: pecaric@hazu.hr ‡E-mail: iperic@pbf.hr

<sup>§</sup>E-mail: predrag.vukovic@vus-ck.hr

**Keywords and Phrases:** Hilbert's inequality, Conjugate exponents, Nonconjugate exponents, The Laplace transform, The beta function, The gamma function.