

Krnić, Mario; Lovričević, Neda; Pečarić, Josip

Jensen's operator and applications to mean inequalities for operators in Hilbert space.
(English) [Zbl 1248.47018](#)

Bull. Malays. Math. Sci. Soc. (2) 35, No. 1, 1-14 (2012).

Let $\mathcal{F}([a, b], \mathbb{R})$ denote the set of all continuous convex functions on an interval $[a, b]$. Then Jensen's operator $\mathcal{J} : \mathcal{F}([a, b]; \mathbb{R}) \times \mathcal{B}_h(H) \times [a, b] \times \mathbb{R}_+^2 \rightarrow \mathcal{B}_+(H)$ is defined by

$$\mathcal{J}(f, D, \delta, p) = p_1 f(D) + p_2 f(\delta)I - (p_1 + p_2) f\left(\frac{p_1 D + p_2 \delta I}{p_1 + p_2}\right),$$

where $p = (p_1, p_2)$, $aI \leq D \leq bI$, and I denotes the identity operator on the Hilbert space H . In this paper, the authors investigate some properties of Jensen's operator, find lower and upper bounds for it, and establish some bounds for the spectra of Jensen's operator by means of the discrete Jensen's functional (see [*S. S. Dragomir, J. E. Pečarić and L.-E. Persson, Acta Math. Hung. 70, No. 1-2, 129-143 (1996; Zbl 0847.26013)*]) and finally get refinements of previously known mean inequalities for operators acting on Hilbert spaces.

Reviewer: [Mohammad Sal Moslehian \(Mashhad\)](#)

MSC:

47A63 Linear operator inequalities
26D15 Inequalities for sums, series and integrals

Cited in **1** Review
Cited in **9** Documents

Keywords:

Jensen's inequality; Jensen's functional; Jensen's operator; Hilbert space; bounded self-adjoint operator; positive invertible operator; arithmetic operator mean; geometric operator mean; harmonic operator mean; superadditivity; monotonicity; refinement; conversion; Kantorovich constant

Full Text: [Link](#)