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Hermite-Hadamard type inequalities for increasing radiant functions. (English)

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JIPAM, J. Inequal. Pure Appl. Math. 4, No. 2, Paper No. 47, 13 p. (2003).

The author calls "radiant function" a subhomogeneous one, i.e., satisfying $f(ax) \leq af(x)$ for any $a \in (0,1)$, and $x \in \mathbb{R}^n_+$. Then, assuming also that if $f > 0$ is increasing (i.e., $x \geq y$ implies $f(x) \geq f(y)$, where $x \geq y$ means the coordinate-wise order relation), he proves Hadamard-type integral inequalities on $\mathbb{R}^n_+$. We quote the following result in $\mathbb{R}_+$: If $f > 0$ is increasing and subhomogeneous on $[a,b]$, then

$$f(\sqrt{(b-a)^2+b^2}-(b-a)) \leq \frac{1}{b-a}\int_a^b f(x)\,dx.$$

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MSC:

26D15 Inequalities for sums, series and integrals
26A51 Convexity of real functions in one variable, generalizations
26B25 Convexity of real functions of several variables, generalizations

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integral inequalities; convex functions; subhomogeneous functions; Hadamard type inequality

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