SUBADDITIVE INEQUALITIES FOR OPERATORS

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Abstract. In this article, we present a new subadditivity behavior of convex and concave functions, when applied to Hilbert space operators. For example, under suitable assumptions on the spectra of the positive operators $A$ and $B$, we prove that

$$2^{1-r}(A+B)^r \leq A^r + B^r,$$

for $r > 1$ and $r < 0$, and

$$A^r + B^r \leq 2^{1-r}(A+B)^r,$$

for $r \in [0,1]$. These results provide considerable generalization of earlier results by Aujla and Silva. Further, we present several extensions of the subadditivity idea initiated by Ando and Zhan, then extended by Bourin and Uchiyama.

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REFERENCES