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A-Numerical Radius of Semi-Hilbert Space Operators

Let $\mathbf{A} = \begin{pmatrix} A & 0 \\ 0 & A \end{pmatrix}$ be a 2×2 diagonal operator matrix whose each diagonal entry

is a positive bounded linear operator A acting on a complex Hilbert space $\mathcal{H}$. Let T, S and R be bounded linear operators on $\mathcal{H}$ admitting A-adjoints, where T and R are A-positive. By considering an $\mathbf{A}$-positive 2×2 operator matrix

$\begin{pmatrix} T & S^{\sharp_A} \\ S & R \end{pmatrix}$, we develop several upper bounds for the A-numerical radius of S.

Applying these upper bounds we obtain new A-numerical radius bounds for the product and the sum of arbitrary operators which admit A-adjoints. Related other inequalities are also derived.

Keywords: A-numerical radius, positive operator, seminorm, semi-inner product.

MSC: 47A05, 47A12, 47A30, 47B15.