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On the Bounds for the Spectral and $\ell _p$ Norms of the Khatri-Rao Product of Cauchy-Hankel Matrices

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Abstract: In this paper we first establish a lower bound and an upper bound for the ℓ_p norms of the Khatri-Rao product of Cauchy-Hankel matrices of the form $H_n = [1/(g+(i+j)h)]_{i,j=1}^{n}$ for $g = 1/2$ and $h = 1$ partitioned as

$$H_n = \begin{pmatrix} H_n^{(11)} & H_n^{(12)} \\ H_n^{(21)} & H_n^{(22)} \end{pmatrix}$$

where $H_n^{(ij)}$ is the ijth submatrix of order $m_i \times n_j$ with $H_n^{(11)} = H_{n-1}$. We then present a lower bound and an upper bound for the spectral norm of Khatri-Rao product of these matrices.

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