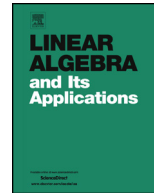




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### The Hankel matrix rank theorem revisited



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#### ABSTRACT

We give a new short proof of a version of a Hankel matrix rank theorem. That version expresses the rank of  $H$  by the smallest possible rank of an infinite Hankel matrix containing  $H$ . The new approach is based on application of the Kronecker theorem.

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A Hankel matrix is a rectangular matrix of form

$$H = \begin{pmatrix} s_1 & s_2 & s_3 & \dots & s_q \\ s_2 & s_3 & s_4 & \dots & s_{q+1} \\ s_3 & s_4 & s_5 & \dots & s_{q+2} \\ \cdot & \cdot & \cdot & \cdot & \cdot \\ s_p & s_{p+1} & s_{p+2} & \dots & s_l \end{pmatrix} \quad (l = p + q - 1). \quad (1)$$

Thus, a Hankel matrix is characterized by the property that the  $(i, j)$  entry depends only on the sum  $i + j$ . Infinite Hankel matrices

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