

Lower Bounds For the Condition Number of  
a Real Confluent Vandermonde Matrix<sup>1</sup>

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ABSTRACT

Lower bounds on the condition number  $\kappa_p(V_c)$  of a real confluent Vandermonde matrix  $V_c$  are established in terms of the dimension  $n$  or  $n$  and the largest absolute value among all nodes that define the confluent Vandermonde matrix or  $n$  and the interval that contains the nodes. In particular, it is proved that for any modest  $k_{\max}$  (the largest number of equal nodes),  $\kappa_p(V_c)$  behaves no smaller than  $\mathcal{O}_n((1 + \sqrt{2})^n)$ , and than  $\mathcal{O}_n((1 + \sqrt{2})^{2n})$  if all nodes are nonnegative. It is not clear whether those bounds are asymptotically sharp for modest  $k_{\max}$ .

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<sup>1</sup>This report is available on the web at <http://www.ms.uky.edu/~math/MAreport/PDF/2004-10.pdf>.

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