1011-15-103        **Shaun M Fallat\*** (`sfallat@math.uregina.ca`), Department of Mathematics and Statistics, University of Regina, Regina, Sask. S4S 0A2, Canada. *On the Exponents of Oscillatory Matrices.*

A real matrix is called totally nonnegative (resp. totally positive) if all of its minors are nonnegative (resp. positive). An $n \times n$ matrix is said to oscillatory if it is totally nonnegative and some positive integral power of it is totally positive. The exponent of an oscillatory matrix $A$ is the smallest positive integer $k$ such that $A^k$ is totally positive. Gantmacher and Krein proved long ago that $k \leq n - 1$. We will present a new "combinatorial" proof of this result and describe the subclass of $n \times n$ oscillatory matrices whose exponent is equal to $n - 1$. (Received August 18, 2005)