

1086-VN-531      **Max A Gross\*** (maxgross17@gmail.com), 4 Isaac Ln, Cherry Hill, NJ 08002, and **Nicole Marsaglia** (nicolemarsaglia@gmail.com), 4593 Orchard Heights Rd, Salem, OR 97304.  
*Vexillary Permutations.*

This paper examines the permutation matrix of a vexillary permutation and its reduced expressions. The Vexillary Metropolis Algorithm is created to generate random vexillary permutations after a chosen number of simple transpositions by swapping neighboring elements and checking to ensure that the permutation remains vexillary after each swap. A swap is undone if it creates a nonvexillary subpermutation. Ultimately, reduced expressions are generated in a similar fashion as in Angel, Holroyd, Romik and Virág’s paper “Random Sorting Networks,” by employing the Hook Walk Algorithm and inverse Edelman-Green process. In addition to a discussion of the patterns found in the matrices of vexillary permutations, this paper includes a proof of the algorithm’s ability to generate all possible vexillary permutations, a proposition that if there exists more than one nonvexillary subpermutation then the only simple transposition that can be performed is switching back the transposed elements and a proposition of the maximum number of nonvexillary subpermutations that a simple transposition can yield. (Received September 06, 2012)