1035-11-1094 **Mark G Yarbrough*** (Mark.Yarbrough@USiouxFalls.edu), 1101 W. 22nd St., Sioux Falls, SD 57110. *Number-Theoretic Weighted Transform for Large-Integer Arithmetic.*

The weighted transform for complex numbers has been used in many software packages for factoring and primality testing. This paper specifically applies the number-theoretic transform using a finite group $\mathbf{Z}/n\mathbf{Z}$. This paper discusses the minimal required transform lengths, the expected computation time compared with complex weighted transforms, and empirical results of this approach compared with the other methods for performing the Lucas-Lehmer test on Mersenne numbers (2^p-1). Finally, this paper discusses further directions of improvement for this representation of large integers. (Received September 18, 2007)