1135-C1-2898 **Chon In Luk** and **Jeffrey Yeh***, jeffreyyeh@cpp.edu, and **Lyheng Phey**, **Luis Cervantes**, **John Kath** and **Tanner Thomas**. *Powers of Matrices and Exponential Matrices.* Preliminary report.

We are interested in finding computationally efficient and accurate ways to find powers of an n x n matrix, M, and exponential matrices, exp(M), under the assumptions that M has n-distinct known real eigenvalues and when $n > 10$. We compare the traditional method of diagonalization to a Cayley-Hamilton, Vandermode matrix approach. As applications, we consider powers of one-step transition probability matrices, P, representing certain Markov chains and the matrix of transition probability functions, exp(Qt), corresponding to Markov processes where is Q is an n x n constant rate matrix and t is time. (Received September 26, 2017)