1106-15-2577 **Diane Pelejo*** (dppelejo@email.wm.edu) and **Chi Kwong Li** (ckli@math.wm.edu). *A Decomposition Scheme for some Unitary Matrices.*

Given a 2^n-by-2^n unitary matrix U, we provide a scheme to write U as a product of matrices $U_1 \cdots U_d$ where each U_i is of the form

$$U_i = I_{2^n} + P_1^{(i)} \otimes \cdots \otimes P_n^{(i)}$$

and the P_j's are is either E_{11}, E_{22}, I_2 or $V - I_2$ for some unitary 2-by-2 matrix V. Let

$$C(U_i) = \#\{j | P_j^{(i)} = E_{11} \text{ or } E_{22}\}.$$

We say that the total cost of the decomposition is $\sum_{i=1}^{d} C(U_i)$. The scheme we present improves the cost of a previous scheme for big enough n. (Received September 16, 2014)