1106-VN-2463 **Steven Schluchter*** (sschluch@gmu.edu), Department of Mathematical Sciences, George Mason University, 4400 University Drive, MS: 3F2, Fairfax, VA 22030. *Applications of ordinary voltage graph theory to graph embeddability, parts 1 and 2.*

We will develop and apply our homologically driven matrix analysis to the study of ordinary voltage graph embeddings. An ordinary voltage graph embedding is an assignment of algebraic data to the directed edges of a cellularly embedded graph, which encodes a highly symmetric embedding, called the derived embedding, of the derived graph in the derived surface. It is a consequence of ordinary voltage graph theory that if a graph G is cellularly embedded in a surface S in such a way that a free action of a group A on G extends to a cellular automorphism of S, then the embedding can be encoded in the form of an ordinary voltage graph embedding. We will show that for each prime p $>$ 5, the generalized petersen graph GP(2p,2) can be embedded in the torus, but not as a derived embedding. Furthermore, we will show that for each prime q $>$ 3, there exists an ordinary voltage graph that has no derived embedding in the nonorientable surface of Euler characteristic 2-2q, yet the corresponding derived graph does have an embedding in this surface. (Received September 16, 2014)