1046-05-1048 **Zhongyuan Che*** (zxc10@psu.edu), Department of Mathematics, 100 University Dr., Penn State Beaver, Monaca, PA 15061, and **Zhibo Chen** (zxc4@psu.edu), Department of Mathematics, 4000 University Drive, Penn State Greater Allegheny, Mckeesport, PA 15132. *Forcing faces in plane bipartite graphs.*

A finite face s of a 2-connected plane bipartite graph G is said to be a forcing face of G if the subgraph of G obtained by deleting all vertices of s together with their incident edges has exactly one perfect matching. We prove that any connected plane bipartite graph with a forcing face is elementary, and for any integers n and k with $n \geq 4$ and $n \geq k \geq 0$, there exists a plane elementary bipartite graph such that exactly k of the n finite faces of G are forcing. On the other hand, any connected cubic plane bipartite graph has no forcing faces. Using the tool of Z-transformation graphs, we characterize the plane elementary bipartite graphs whose finite faces are all forcing. We also obtain a necessary and sufficient condition for a finite face in a plane elementary bipartite graph to be forcing, which enables us to investigate the relationship between the existence of a forcing edge and the existence of a forcing face in a plane elementary bipartite graph, and find out that the former implies the latter but not vice versa. Moreover, we characterize the plane bipartite graphs that can be turned to have all finite faces forcing by subdivisions. (Received September 14, 2008)