1145-VP-500 **Zhongyuan Che*** (zxc10@psu.edu). *A characterization of the resonance graph of an outer plane bipartite graph.* Preliminary report.

Let G be a 2-connected outer plane bipartite graph. The resonance graph of G, denoted by $Z(G)$, is a graph whose vertex set is the set of all perfect matchings of G and two vertices are adjacent in $Z(G)$ if their symmetric difference is the boundary of a finite face of G. Assume that s is a reducible face of G and H is the subgraph of G obtained by removing all internal vertices (if exist) and edges on the common periphery of s and G. We show that $Z(G)$ can be obtained from $Z(H)$ by a peripheral convex expansion. It follows that $Z(G)$ can be obtained from an edge by a sequence of peripheral convex expansions with respect to a reducible face decomposition of G. As an application, we prove that $\Theta(Z(G))$ is a tree and isomorphic to the inner dual of G, where $\Theta(Z(G))$ is the induced graph on the Djoković-Winkler relation Θ-classes of $Z(G)$. Our results generalize the corresponding ones given by Klavžar et al. for resonance graphs of catacondenesed hexagonal systems and catacondensed even ring systems. (Received September 07, 2018)