1145-I1-2470 **Chassidy Bozeman*** (bozeman1@stolaf.edu). *The tree cover number and positive semidefinite maximum nullity of a graph.*

For a simple graph $G = (V, E)$, let $\mathcal{S}_+(G)$ denote the set of real positive semidefinite matrices $A = (a_{ij})$ such that $a_{ij} \neq 0$ if $\{i, j\} \in E$ and $a_{ij} = 0$ if $\{i, j\} \notin E$. The maximum positive semidefinite nullity of G, denoted $\mathrm{M}_+(G)$, is $\max\{\text{nullity}(A) | A \in \mathcal{S}_+(G)\}$. A tree cover of G is a collection of vertex-disjoint simple trees occurring as induced subgraphs of G that cover all the vertices of G. The tree cover number of G, denoted $T(G)$, is the cardinality of a minimum tree cover. It is known that the tree cover number of a graph and the maximum positive semidefinite nullity of a graph are equal for outerplanar graphs, and it was conjectured in 2011 that $T(G) \leq \mathrm{M}_+(G)$ for all graphs [Barioli et al., Minimum semidefinite rank of outerplanar graphs and the tree cover number, *Elec. J. Lin. Alg.*, 2011]. We show that the conjecture is true for certain graph families. Furthermore, we prove bounds on $T(G)$ to show that if G is a connected outerplanar graph on $n \geq 2$ vertices, then $\mathrm{M}_+(G) = T(G) \leq \lceil \frac{n}{2} \rceil$, and if G is a connected outerplanar graph on $n \geq 6$ vertices with no three or four cycle, then $\mathrm{M}_+(G) = T(G) \leq \frac{n}{3}$. (Received September 25, 2018)