1058-15-285 **John Sinkovic*** (`johnsinkovic@gmail.com`) and **Mark Kempton** (`mark.kempton@gmail.com`).
The Minimum Rank Problem for Outerplanar Graphs. Preliminary report.

Given a simple graph $G = (V, E)$ on n vertices and a field F, let $S^F(G)$ equal the set of symmetric $n \times n$ F-valued matrices A such that $a_{ij} \neq 0$ iff $ij \in E$, $i \neq j$. The minimum rank of a graph G over F is equal to $\min\{\text{rank}(A) | A \in S^F(G)\}$. The minimum rank problem of a simple graph G over a field F is to determine the minimum rank of a matrix in $S^F(G)$. The inverse inertia problem of a simple graph G asks which inertias can be obtained by matrices in $S^{\mathbb{R}}(G)$.

A cover for a graph G is a collection of subgraphs of G such that every edge and vertex of G lie in at least one of the subgraphs in the collection. A graph G is outerplanar if there exists a planar drawing of G such that every vertex lies on the outer face of G. We discuss previous results concerning outerplanar graphs and show that every outerplanar graph G has a clique, star, cycle cover such that the sum of the minimum ranks of the graphs in the cover is equal to the minimum rank of G. We discuss corollaries to this result which have implications for determining the positive semi-definite minimum rank and the inertia of an outerplanar graph. (Received February 16, 2010)