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Dong Ye* (dong.ye@mtsu.edu), Department of Mathematical Sciences, MTSU Box 34,
Murfreesboro, TN 37130. *Inverses of Graphs*. Preliminary report.

Let (G, w) be a weighted graph with a weight-function $w : E(G) \rightarrow \mathbb{R} \setminus \{0\}$. A weighted graph (G, w) is invertible to a new weighted graph if its adjacency matrix is invertible. The inverse of a weighted graph (G, w) can be characterized based on the Sachs subgraphs of G that are spanning subgraphs with only K_2 or cycles (or loops) as components. The inverses of bipartite graphs with a unique perfect matching have strong connections with the Mobius function of posets. Besides the combinatorial interests, graph inverses can be applied to bound median eigenvalues of graphs. In this talk, some recent developments on inverses of graphs will be presented. This talk is based on joint work with D. Klein, B. Mandal and Y. Yang. (Received August 10, 2015)