1050-05-53   **Brigitte Servatius*** (`bservat@wpi.edu`), Mathematical Sciences, WPI, 100 Institute Rd, Worcester, MA 01609. *Polarity and rigidity in the plane.*

If the edges of a graph, G, are interpreted as rigid bodies and vertices of G are interpreted as pin joints, then the rigidity of a generic realization is a combinatorial property, which is well studied. We examine the behavior of the rigidity properties under the polar construction in the plane, which takes lines to points and points to lines. To every graph in the plane we get a corresponding line arrangement and we can now view the lines as rigid bodies, which are pinned at certain intersection points, namely those, which are polar images of the edges of G. We give a formula for the degrees of freedom of this line arrangement derived from the rigidity properties of the graph G. (Received February 21, 2009)