1096-14-722   **Charles W. Wampler*** (`charles.w.wampler@gm.com`), General Motors R&D, Mail Stop 480-106-224, 30500 Mound Road, Warren, MI 48090-9055. *Applications of Numerical Real Algebraic Geometry to Kinematics.* Preliminary report.

Recently, numerical algorithms have been developed for computing cell decompositions of the real points in complex algebraic curves and surfaces. These algorithms operate in the spirit of Morse theory by introducing a real projection and using numerical algebraic geometry to find the critical sets where the topology of the real fibers of the projection change. After slicing the set between critical points to get the generic behavior in each interval, one uses continuation to the critical points to determine how the pieces glue together to make the whole set. After a brief review of the state of the art in this approach, we will concentrate on how these methods apply to several examples from the kinematics of mechanism design and robot control. (Received September 09, 2013)