1030-65-325   **Kathy Wei Piret*** (`kathywang@math.uic.edu`), University of Illinois at Chicago, Department of Math, Stat &CS, 851 S. Morgan St (MC 249), Chicago, IL 60607-7045, and **Jan Verschelde** (`jan@math.uic.edu`), University of Illinois at Chicago, Department of Math, Stat & CS, 851 S. Morgan St (MC 249), Chicago, IL 60607-7045. *Computing Critical Points by Continuation.* Preliminary report.

To compute critical points of polynomial systems with parameters we may apply the Jacobian criterion. A major shortcoming of this Jacobian criterion is that the augmented system may get too large to solve. Therefore, we locally apply a so-called sweep for critical values, tracking solution paths for a range of the parameter values. Our applications include polynomial systems arising in models of neural networks, molecular configurations and symmetrical Stewart-Gough platforms. We have satisfactory experience locating quadratic turning points. Currently we are investigating the use of higher-order derivatives to detect and compute higher-order critical points via a sweep. (Received August 06, 2007)