1056-R1-1779   **Paul E. Seeburger*** (`pseeburger@monroecc.edu`), 1000 E. Henrietta Rd., Rochester, NY 14623.
Exploring Velocity and Acceleration Vectors Visually. Preliminary report.

In multivariable calculus, we ask students to calculate vector-valued functions for velocity and acceleration, given a position function. Students often find it easy to visualize the velocity vector being tangent to the space curve describing the motion, but they rarely have a clear picture of the acceleration vector and its relationship to the motion and to the corresponding velocity. Using a freely available online multivariable calculus applet called CalcPlot3D, students can complete a guided exploration of velocity and acceleration. CalcPlot3D is part of an NSF-funded grant project called Dynamic Visualization Tools for Multivariable Calculus (DUE- CCLI #0736968). See http://web.monroecc.edu/calcNSF/. As part of this guided activity, students complete a pre-test, answer exploration questions, and then complete a post-test. The pre- and post-tests measure what improvement occurs in their conceptual understanding of velocity and acceleration by completing the visual exploration. Student responses to this online activity can be sent to instructors for grading purposes. This exploration is part of a larger collection being developed for this project. (Received September 22, 2009)