1106-G5-2846   **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, but they rarely have a clear picture of the acceleration vector and its relationship to the motion and to the corresponding velocity vector. Using a freely available online multivariable calculus applet called CalcPlot3D, students can complete a guided exploration of velocity and acceleration. As part of this guided activity, students complete a pre-test, answer exploration questions, and then complete a post-test. After students have completed this activity, there is often a lively class discussion about the interaction between the acceleration and velocity vectors they observed in the dynamic examples from the exploration. Through this discussion most misunderstandings are cleared up, and students become more confident in what they learned from the exploration. In addition to demonstrating this online exploration, analysis of the pre- and post-test results and student comments on their own learning will be shared. CalcPlot3D is part of an NSF-funded grant project (DUE- CCLI #0736968). See http://web.monroecc.edu/calcNSF/. (Received September 16, 2014)