Meeting: 1006, Lubbock, Texas, SS 14A, Special Session on Undergraduate and Graduate Student Research (and Related Poster Session organized by Ali Khoujmane and Mara D. Neusal, Texas Tech)

1006-34-144 **Baili Chen*** (cbaili@yahoo.com), Department of Mathematics, Texas Tech University, Lubbock, TX 79409, and **Clyde F. Martin**, Department of Mathematics, Texas Tech University, Lubbock, TX 79409. *Mathematical Model of Visual Motion-Detection in Flies.*

Visual motion-detection is one of the most active areas in neuroscience today. Several nonlinear differential equations are derived to model the dendrities which carry information to the tangential cells in the fly's vision system and to model the dynamics in the synaptic inputs. One of these can be reduced to an asymmetric forced van-der-pol equation. It is found that when the parameters are within certain range, there exists a periodic solution for this equation. Detailed analysis of this periodic solution can explain how the vision system of the fly encodes the motion signals like the change of the direction. This knowledge may be used to design an electrical circuit whose function can be expressed as the differential equation and then can be used to detect the change of motion directions. (Received February 14, 2005)