1100-37-386 **Edward W Hooton***, exh121730@utdallas.edu. *Towards understanding global behaviour of branches of periodic solutions in systems of symmetrically coupled Van der Pol equations.* Preliminary report.

We investigate a system of 8 Van der Pol oscillators, which are coupled in the formation of a cube. In this setting topological degree methods which are sensitive to the symmetry of the system have allowed us to understand the Hopf bifurcations from the trivial stationary solution. There are 4 Hopf points which due to symmetry have many periodic branches born at each. The equivariant degree method identifies the spatio-temporal symmetry characteristics the periodic orbits born at each hopf point will have. Using this information we identify flow invariant subspaces which are of much smaller dimension then the full system.

Inside these flow invariant subspaces we investigate behaviour of the periodic branches for all values of the bifurcation parameter. We ask do branches grow unboundedly, or perhaps they collapse and are annihilated at another Hopf point, or maybe the collide with another periodic solution and are annihilated in a fold bifurcation.

We also investigate stability of the orbits within the flow invariant subspace, and the possibility to stabilise them using a combination of linear control and time delayed feedback control. (Received February 11, 2014)