
YUMING CHEN, Wilfrid Laurier University

Equivariant normal forms for parameterized delay differential equations with application to equivariant Hopf bifurcation

This talk concerns with the equivariant normal form of delay differential equations with parameters in the presence of symmetry. We present and justify a process that involves center manifold reduction and normalization preserving the symmetry, and that yields normal forms explicitly in terms of the coefficients of the original system. We observe that the form of the reduced vector field relies only on the information of the linearized system at the critical point and on the inherent symmetry, and the normal forms give critical information about not only the existence but also the stability and direction of bifurcated spatiotemporal patterns. We illustrate our general results with application to equivariant Hopf bifurcation.