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Tian Ma, Department of Mathematics, Sichuan University, Chengdu, Sichuan, Peoples Rep of China, and **Shouhong Wang*** (showang@indiana.edu), Department of Mathematics, Indiana university, Bloomington, IN 47405. *Dynamic bifurcation and stability of the Taylor problem.*

We shall present in this talk our recent work on a new dynamic bifurcation and stability theory and its applications to the Taylor problem in fluid mechanics. The bifurcation and stability theory is centered at a notion of bifurcation, called attractor bifurcation for nonlinear evolution equations. The main ingredients include the attractor bifurcation theory, together with new strategies for the center manifold reduction procedures. A recipe of the theory toward to applications is presented in this talk. The application to the Taylor problem focuses on 1) the stability and bifurcation of solutions, and on 2) the structure of the bifurcated solutions in the physical space. (Received September 07, 2005)