

Fall
2016

Mathematical Sciences
Seminar

“Extension to nonlinear stability theory of the circular Couette flow”

A nonlinear stability analysis of the viscous circular Couette flow to axisymmetric perturbations is rigorously developed based on the Arnol'd energy-Casimir method. Novel sufficient conditions are found in this study for the nonlinear stability of the circular Couette flow. When the flow is nonlinearly stable and evolves axisymmetrically for all time, then it always decays asymptotically in time to the circular Couette flow determined uniquely by the setup of the rotating cylinders. Comparisons with historical studies show that our results shed light on the experimental measurements of Wendt (1933) and significantly extend the classical nonlinear stability results of Serrin (1959) and Joseph and Hung (1971). In the talk, I will focus on the basic idea rather than the technical detail.

Professor Shixiao Wang

(University of Auckland)

Monday, October 24, 2016

4:00-5:00PM

Lally 104

Host: Chjan Lim



