

SEMINAR NOTICE

Preston M. Green Department of Electrical and Systems Engineering

LabVIEW Based Whispering Gallery Mode Microtoroid Coupling PID Controller

MS Dissertation Defense

By

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Abstract: The aim of this thesis is to test the implementation of PID control algorithm for stabilization of coupling. Efficient and robust coupling is prerequisite in microcavity related applications. But surrounding environments, like temperature and airflow, could easily influence coupling condition. PID algorithm has been used for stabilization and control in industry for several decades. For this reason, the author decided to test further application, with the goal of proving the suitability for Whispering Gallery Mode coupling.

The thesis first discusses the Whispering Gallery Mode microtoroid, especially its relative coupling regime. In a second stage, the LabVIEW and Arduino based real time control system structure is introduced. And then, the PID control algorithm is discussed. Finally, experiments results are charted to prove the stability and robust coupling.

The results of experiment show that PID algorithm is well suited to stabilize the coupling system. However, due to the nonlinearity of the system, the PID coefficients need to be approximately adjusted in different coupling cases.

DATE: Friday, November 30, 2012
TIME: 1:00 p.m.
PLACE: Bryan Hall, Room 305

Research Advisor:

Dr. Lan Yang

This seminar is in partial fulfillment
of the Masters Degree