1036-78-181 **Edward D. Farnum*** (efarnum@kean.edu), Kean University, Science, Technology & Mathematics Education, 1000 Morris Ave, Union, NJ 07083. *Bifurcation structure in multi-frequency mode-locked lasers.*

A theoretical model is presented which describes the behavior of a laser source subject to wavelength division multiplexing. Depending upon values for system parameters describing gain saturation and nonlinear coupling between channels, the system may support a variety of solution types. These include simultaneously mode-locked pulse solutions and pulse splitting in one or more frequency channels. In this talk, I will present the underlying assumptions of the model, and investigate how the stability of mode-locked solutions depends upon various system parameters. (Received January 22, 2008)