Abstract Submitted for the TSF12 Meeting of The American Physical Society

Resonant Circuit Simulation and Development for LIGO Lasers¹ JOSEPH COLEMAN, The University of Texas at Dallas — The modulation of a laser, as part of a feedback mechanism, in order to control optic components for stabilization, requires the use of the electro-optic effect. To create the electric field needed for the electro-optic effect a large voltage is obtained through a Pockels cell as part of a resonant circuit. The resonant circuit functions as the voltage gain mechanism. A mathematical model of the circuit was constructed as a tool for helping to build a specifically tuned modulating circuit. Subtle features of the pi-network circuit design currently being used at LIGO were found. Additional criteria involving impedance matching is discussed. Alternative circuit designs are presented that could potentially offer better resonance conditions for the electro-optic modulator.

¹NSF REU program at The University of Texas at Brownsville

Joseph Coleman The University of Texas at Dallas

Date submitted: 20 Sep 2012

Electronic form version 1.4