EE/CprE/SE 492 WEEKLY REPORT 1

January 1st – February 10th

Group number: 29

Project title: Building Blocks and Sub-Circuits with Magnetic Field Generators

Client &/Advisor: Robert Bouda, Wei Shen Theh, Mani Mina

Team Members/Role:

Andrew Murphy - Circuit Design, Simulation and Testing
Steven Huynh - Circuit Design, Simulation and Testing
William Nichols - CST Waveguide and Coupler Models Designer
Michael Lopez - Matlab/Simulink Mach-Zehnder Model Designer
Umair Sarwar - Inductor coil in Comsol Designer

- **Weekly Summary** For this week, the team members worked on a variety of different goals. First we researched how to implement Zero Voltage Switching (ZVS) into our circuit. After testing the circuit in MultiSim, we felt comfortable ordering parts to start breadboard testing next week. We started experimenting with CST to try and make an optical model of the Mach-Zehnder loop. We also started researching a new type of inductor using COMSOL to verify magnetic flux densities. We also continued to develop simulations of the Mach-Zehnder and Sagnac loop in Matlab from last semester.

- **Past week accomplishments**
  - Andrew: Created ZVS design to remove power loss from MOSFET.
  - Umair: Created simulation of new coil design.
  - Steven: Created parts list.

- **Pending issues** *(If applicable: Were there any unexpected complications? Please elaborate.)*
  - William: Unable to solve some problems in CST. Waveguide design was more complex than we initially thought.
  - Michael: We are currently having issues importing a python model provided by our client to MATLAB.

- **Individual contributions**

NAME	**Individual Contributions** *(Quick list of contributions. This should be short.)*	**Hours this week**	**HOURS cumulative**
Andrew Murphy	ZVS design, update KiCad, datasheet	53	53
William Nichols	Research into CST waveguide design and coupler design	49	49
Michael Lopez	Creating a Mach-Zehnder Optical Simulation within MATLAB/Simulink	80	80
Steven Huynh	Assisting in KiCad PCB design, creating parts list	25	25
Umair Sarwar	Researched and simulated new coil design in COMSOL.	35	35

- **Plans for the upcoming weeks** *(Please describe duties for the upcoming week for each member. What is(are) the task(s)? Who will contribute to it? Be as concise as possible.)*
  - •Andrew and Steven: Order parts and perform breadboard testing.
  - • Michael: Continue Mach-Zehnder simulation development in MATLAB
  - • William: Continued Waveguide design to implement a Mach-Zehnder loop simulation in CST.
  - • Umair: Update new coil design with new dimensions and verify magnetic flux density