**Continuous Repetition Rate Tuning from 960 MHz to 1.72 GHz of a sub-300 femtosecond Mode-Locked Semiconductor Disk Laser**

**Figure 1 A-B**

These plots are all rendered in matlab, and derive from “barploth29v623.m; within which, H29\_14D\_4r-layercalc.mat and V623-layercalc.mat are loaded. The E-Field curve is calculated using a multilayer calculator in Igor and the data is exported. In each of the above, this e-field data is given by wdispwav in each .mat file, and zstruct defines the distance into the structure from the air interface. The colour blocks are defined in the .m file. Please refer to the paper for which colour block defines which growth material.

**Figure 2 A-D**

Data for these plots are calculated in the same multilayer calculator as for figure 1. A and B describe the GDD and reflectivity+field overlap on the quantum wells, respectively, while C and D describe the same properties of the SESAM. The .m file loads H29\_14D\_4r-layercalc.mat and V623-layercalc.mat, and uses GDD, minus\_GDD, plus\_GDD, Refl, minus\_Refl, plus\_Refl, combined\_matrix\_avg\_all, minus\_ combined\_matrix\_avg\_all, and plus\_combined\_matrix\_avg\_all variables, respectively, for each pair of subplots.

**Figure 4 A-D**

Data in this figure are calculated using the freeware software package “reZonator”, or by constructing a Gaussian beam matrix for the cavity in any suitable programming language.

**Figure 5 A-D**

Pulsecharac3d.m loads .mat files from the folders “AC”, “OS” and “RF” and plots. Each .mat filename in folders AC and OS corresponds to the specific repetition rate of the cavity, while in file RF, each spectrum file represents (in numerical order) the same cavity length positions. For the AC .mat files, repRate and time variables define the horizontal plane axes of figure A, and variables pulse\_signal and pulse\_fit\_signal are the processed pulse data and sech^2 fit to the pulse data respectively.

For the OS .mat files, the repRate and wavelength variables define the horizontal plane axes, and spectrum\_signal contains the pulse spectral data.

Regarding the RF .csv files, starting at row 46 (assuming first row is 1, not 0, as per MS excel numbering for example), column 1 is the RF frequency in Hz, and column 2 is the spectral power in dBm. All other recorded machine settings are stored in rows 2 through 44. It should be noted that files 0012 (2) and 0013 (2) both represent the 1.3 GHz cavity repetition rate, and in the paper these were mistakenly both plotted on top of one another. Because this is not additive, the power data validity is unchanged, and no claims in the underlying physics are invalidated therefore either data file may be used to represent this rep rate.

Load avgpower.mat. Variables pulsedurations and averagepower are plotted, and each contain the cavity repetition rate.