

Abstract Submitted
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Hybrid Pulsed Nd:YAG Laser SAWYER MILLER, SKYLER TRUJILLO, Fort Lewis Coll, FORT LEWIS COLLEGE LASER GROUP TEAM — This work concerns the novel design of an inexpensive pulsed Nd:YAG laser, consisting of a hybrid Kerr Mode Lock (KLM) and Q-switch pulse. The two pulse generation systems work independently, non simultaneously of each other, thus generating the ability for the user to easily switch between ultra-short pulse widths or large energy density pulses. Traditionally, SF57 glass has been used as the Kerr medium. In this work, novel Kerr mode-locking mediums are being investigated including: tellurite compound glass (TeO_2), carbon disulfide (CS_2), and chalcogenide glass. These materials have a nonlinear index of refraction orders of magnitude, (n_2), larger than SF57 glass. The Q-switched pulse will utilize a Pockels cell. As the two pulse generation systems cannot be operated simultaneously, the Pockels cell and Kerr medium are attached to kinematic mounts, allowing for quick interchange between systems. Pulse widths and repetition rates will vary between the two systems. A goal of 100 picosecond pulse widths are desired for the mode-locked system. A goal of 10 nanosecond pulse widths are desired for the Q-switch system, with a desired repetition rate of 50 Hz. As designed, the laser will be useful in imaging applications.

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