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Pulse Repetition Frequency locking by pump modulation in numerical simulations of a diode end pumped passively Q-switched Nd:YAG laser with a Cr⁴⁺:YAG saturable absorber

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Passively Q-switched Nd:YAG lasers with Cr⁴⁺:YAG as a saturable absorber that can operate with pulse repetition frequencies (PRF) in the hundreds of kilohertz typically have problems with pulse to pulse fluctuations of pulse energy and width and the associated timing jitter as well as drift in PRF. One technique for stabilizing the PRF and reducing fluctuations is modulation of pump power. This technique has been simulated using a plane wave rate equation model with square wave pump modulation at frequency of 100 kHz. Locking of the pulse repetition rate is achieved at the modulation frequency over a range of pump powers. This locking range is dependent on the modulation function, a square wave with a 50

Level (Hons, MSc, PhD, other)?

MSc

Consider for a student award (Yes / No)?

Yes

**Would you like to
 submit a short paper
 for the Conference
 Proceedings (Yes / No)?**

No

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