

Cavity Ring-Down Spectroscopy with diode side pumped Nd:YLF4 at 1053 nm and 1 mJ per pulse.

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This presentation shows a Nd:YLF4 diode side pumped resonator at 1053 nm and 1 mJ pulse energy for cavity ring-down spectroscopy (CRDS) in order to measure losses in a monocrystalline fibers of $\text{LiLa}(\text{MoO}_4)_2\text{Nd}^3$ and their use in lasers. The mode selective technique that employs a double pass of the fundamental laser mode through the crystal and this folded cavity is very stable. Moreover, this cavity used with 35.4 W pumping at 792 nm for a quasi-continuous (qcw) laser that was optimized for Q-switching operation and therefore favouring the TEM00 laser mode with good efficiency, not to mention the diffraction limited beam quality of $M^2 = 1.31$. The CRDS with two highly reflective mirrors uses one mirror with 0.2 meter radius of curvature (ROI) and the other mirror with uses a ROI of 1 meter, which means that the CRDS cavity has a length of about one meter and 17 centimeters. Every time the pulse is reflected in the cavity, a small fraction of light is transmitted through the end mirror and is captured by a quick-response detector which measures the magnitude of transmitted light as a function of time. The result is an exponential decay curve with a time constant.