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Increasing Laser Stability with Improved Electronic Instruments[1]
DAYLIN TROXEL, AARON BENNETT, CHRISTOPHER J. ERICKSON, TYLER JONES, DALLIN S. DURFEE, Brigham Young University — We present several electronic instruments developed to implement an ultra-stable laser lock. These instruments include a high speed, low noise homodyne photo-detector; an ultrahigh stability, low noise current driver with high modulation bandwidth and digital control; a high-speed, low noise PID controller; a low-noise piezo driver; and a laser diode temperature controller. We will present the theory of operation for these instruments, design and construction techniques, and essential characteristics for each device.

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