

A Large Dynamic Range Digital Controller For Use With Carbon Dioxide Pumped FIR Lasers

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Carbon dioxide pumped FIR (Far Infrared) lasers have a number of valuable uses in the diagnostics arena of fusion research. To maintain lasing, the tuning of the two lasers must be tightly coupled. This presents interesting control problems. A number of analog approaches have been employed to implement tightly coupled tuning control. Such implementations, however, suffer from a lack of flexibility. A new digital controller has been developed that greatly increases the range of control strategies that may be implemented. Of further interest is the controller's capability to provide 96 dB of dynamic range when driving 200 V piezoelectric transducers. This paper will discuss the algorithms and hardware used in this controller. Lessons learned from the development effort will be presented.

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