Abstract Submitted
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A Tunable, High Energy, Fourier Transform Limited Laser Source for Spectroscopy Applications PATRICK DUPRÉ, TERRY MILLER, The Ohio State University (OH) — We have constructed a Ti:Sa pulsed amplifier and used its beam for mainly infra-red radiation generation either by Scattering Raman Stimulated (SRS) or by Difference Frequency Mixing (DFM). The IR radiation is used to probe cold-jet radical plasmas by CRDS (see the paper devoted to the radical generation). The master (seed) source is a CW high resolution tunable ring Ti:Sa laser injected inside the amplifier which consists of an unstable resonator (slave cavity) including a GRM profile output coupler. The tuning of the slave cavity is accomplished by using the Ramp-Lock-and-Fire (RLF) technique consisting of matching (usually) on resonance the cavity length through the end mirror mounted on an actuator before firing the frequency doubled 20 Hz Nd:YAG pump laser. The implementation of the RLF technique is under the full control of a Digital Signal Processor (DSP). Energy up to 100 mJ and spectral linewidths in the range of 10–30 MHz (FWHM) have been obtained. The detailed functioning of the system will be shown as well as the features of the generated radiation showing the near Fourier transform limited pulse behavior. A model for the amplifier will also be discussed.

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