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A simple technique for spectral control of a mode-locked Ti:Sapphire oscillator JIAHUI PENG, ALEXEI SOKOLOV, Texas A&M University, Physics Department — Synchronous multiple wavelengths and tunable lasing has attracted wide interesting, especially in the frequency mixing and pump-probe experiments. Great interests have been shown in the multi-wavelength operation of the mode-locked Ti:sapphire (TS) laser because of the broad bandwidth and short pulse it can generate. In these previous reports, dual-wavelength was obtained either by manipulating the gain spectrum or dispersion of laser cavity. All the work employing two cavities system face the problem that the two cavities will have to be adjust to same repetition rate, so that one mirror not only needs to be adjustable, but also needs to be adjusted carefully to achieve synchronization. We describe a simple technique to control spectrum, and then generate dual-wavelength of a mode-locked TS laser in a single cavity based on the mechanism of dispersion control, which can generate much wider spectrum bandwidth and much wider separation of two pulses compared with previous work. We also have Tri-wavelength generated in blue range after SHG and SFG with a LBO crystal.

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