

Abstract Submitted
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Creation of Arbitrary Spectra with an Electro-Optical Modulator C.E. ROGERS III, J.L. CARINI, J.A. PECHKIS, P.L. GOULD, Department of Physics, University of Connecticut — We use a waveguide-based electro-optical phase modulator, in conjunction with a nanosecond-timescale arbitrary waveform generator, to produce an arbitrary pattern of sidebands. A linear voltage ramp applied to the modulator changes the optical phase linearly in time. This gives a frequency shift equal to the time derivative of the phase. A repeated sequence of such ramps with differing slopes thus generates a set of sidebands. The time and frequency resolutions are restricted by Fourier considerations. There are also limitations due to the maximum phase change achievable with the modulator and the finite speed of the arbitrary waveform generator. Such multi-line spectra, with sideband spacings in the 100 MHz range, may find use in optical pumping and efficient excitation in multi-level systems. This work is supported by DOE.

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