

Abstract Submitted
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Atomic and Condensed Matter Spectroscopy with an Optical Frequency Comb¹ KEITH PENNEY, DEREK KIMBALL, ERIK HELGREN, JASON SINGLEY, TONY MASIELLO, California State University East Bay, KHOA NGUYEN, San Jose State University — Optical frequency combs are innovative tools created only in the last decade which have made possible many advances in spectroscopy and have enabled ultra-precise atomic clocks based on optical transitions. An optical frequency comb is based on a femtosecond pulsed laser; the Fourier transform of the train of femtosecond pulses is a “comb” of equally-spaced frequencies spanning from visible to infrared. We discuss how the new optical frequency comb at California State University – East Bay will be used for direct spectroscopy of atoms to measure hyperfine structure and search for heretofore undiscovered energy levels in rare earth atoms. We also discuss application of the femtosecond laser for characterization of the optical properties of bulk materials.

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