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**Novel technique for uniform-field transverse electroreflectance using a mode-locked laser and oscillating field** HAIPENG ZHANG, JARED WAHLSTRAND, STEVEN CUNDIFF, JILA, National Institute of Standards and Technology, and University of Colorado, Boulder — Electroreflectance is a widely-used characterization technique for semiconductor materials [1]. A modulated electric field produces a resonant differential reflectance spectrum at band structure critical points. Typical experiments are performed using a longitudinal geometry, due to the ease of generating large electric fields by doping. Transverse geometries, in which the electric field is perpendicular to the light wavevector, yield additional information about the symmetry of critical points. We have developed a way to apply a uniform electric field in a transverse electrode structure by using a radio frequency bias and a sample structure with an insulating layer between electrodes and the sample. The rapidly oscillating bias, synchronized to the laser repetition rate, prevents space charge from building up, and the insulating layer prevents highly nonuniform trap-enhanced fields. This technique could also be used in ultrafast experiments that require a large, uniform, effectively static field. Results are presented for GaAs using a Ti:sapphire laser.

[1] F. Pollak and H. Shen, Mater. Sci. Eng. R **10**, 275-374 (1993).

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