63. Title: Transport properties of free carriers in semiconductors studied by terahertz time-domain magneto-optical ellipsometry

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Abstract: We have developed a terahertz time-domain magneto-optical ellipsometry to deduce the effective mass, scattering time, density, and type (n or p) of free carriers independently. The parameters are derived from diagonal and off-diagonal components of the complex dielectric tensor obtained by measurements of magneto-optical Kerr effects under a magnetic field of 0.46 T using the generalized Drude model. The derivation of these parameters for n-type InAs wafers with different carrier densities is demonstrated. The carrier density dependence of the effective mass agrees well with previously reported experimental results and theoretical calculations that take into account nonparabolicity of conduction bands.