181. Title: Anomalous Charge Transport: A New "Time Domain" Generalization of the Drude Model

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Abstract: We propose a new generalization of the Drude model for describing the conductors in nanostructured form. The new feature that appeared is the assumption of a collective mode at a finite frequency. This leads to the occurrence of anomalous charge transport. With appropriate scattering times it is possible to mimic the infrared properties of oxides and poor conductors in the form of nanoparticles and nanowires. The electron current in these cases reverses its direction before decaying to zero. Specific examples considered are ZnO, TiO2, GaAs, Si, SWCN. The model also predicts that the current will have a damped oscillation in time, a possible new effect detectable with femtosecond time resolved techniques. Results are presented for the velocity correlation functions, the mean square deviation of position and the diffusion coefficient.