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Magneto-Transport in quantum dot films ALEXANDRE POURRET, PHILIPPE GUYOT-SIONNEST, James Franck Institute, The University of Chicago — Colloidal semiconductor quantum dots are being studied intensely because of their tunable optical properties. Quantum dot solids (e.g. films) present further interesting possibilities for designing novel materials with control of the electronic properties at the nanometer scale. While neutral CdSe or CdSe/CdS nanocrystal films are quite insulating, photo excitation or doping the film electrochemically leads to higher conductivity. In this talk I will present photoconductivity and conductivity measurements of charged CdSe and CdSe/CdS nanocrystal films at low temperature under a magnetic field. The combination of electrochemistry and spectroscopy enables the precise control and detection of electrons injected into the quantum dot films. The temperature and electric field dependent conductivity is analyzed with the variable range hopping model of Efros and Shklovskii and the magneto-conductivity is discussed in terms of a spin-blockade.

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