Microwave-enhanced decoherence in one-dimensional metal wires
JIAN WEI, SERGEI PEREVERZEV, MICHAEL GERSHENSON, Rutgers University — We report the effect of monochromatic microwave (MW) radiation on the weak localization corrections to the conductivity of quasi-one-dimensional silver wires. Due to the improved electron cooling in the wires, the MW-induced dephasing was observed without a concomitant overheating of electrons over wide ranges of the MW power $P_{MW}$ and frequency $f$. The observed dependences of the conductivity and MW-induced dephasing rate on $P_{MW}$ and $f$ are in agreement with the theory by Altshuler, Aronov, and Khmelnitsky. Our results suggest that the saturation of dephasing time, often observed at $T \leq 0.1$ K, may be caused by an insufficient screening of the sample from the external microwave noise.