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Manifestation of Work Function Difference in High Order Gundlach Oscillation[1] CHUN-LIANG LIN, SHIN-MING LU, WEI-BIN SU, HWA-TE SHIH, BI-FEN WU, YEONG-DER YAO, CHIA-SENG CHANG, TIEN-TZOU TSONG, Institute of Physics, Academia Sinica, Nankang, Taipei 11529, Taiwan — Gundlach oscillation (or standing-wave state) is a general phenomenon manifesting in the tunneling spectrum acquired from a metal surface using scanning tunneling spectroscopy. Previous studies relate the energy shift between peaks of the lowest-order Gundlach oscillation observed on the thin film and the metal substrate to the difference in their work functions. By observing Gundlach oscillations on Ag/Au(111), Ag/Cu(111) and Co/Cu(111) systems, we demonstrate that the work function difference is not the energy shift of the lowest order but the ones of higher order where a constant energy shift exhibits. Higher order Gundlach oscillations can thus be applied to determine the work function of thin metal films precisely.

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