ARPES on layered compounds: From millielectron volts to femtoseconds

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The latest results from our research program on the electronic structure and dynamics of layered transition-metal dichalcogenides will be presented. The specific aims here are to clarify the interrelationship of charge-density waves and superconductivity in the low-temperature superconductors 2*H*-$NbSe_2$ and electron-doped 1*T*-$TiSe_2$ and to disentangle the interplay of electron-phonon and electron-electron interactions in the Peierls-Mott insulator 1*T*-TaS_2 and the possible excitonic insulator 1*T*-$TiSe_2$. Two complementary experimental approaches are used: synchrotron-based static ARPES with 5-meV energy resolution at temperatures down to 1 K (at the 1^3 endstation of BESSY) and laser-based time-resolved ARPES with 30-fs time resolution employing a high-harmonic-generation source (in the Bauer lab at the University of Kiel).

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