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Electronic Interactions in Iron-Based Superconductors DANIIL EVTUSHINSKY, BESSY II, Helmholtz Zentrum for Materials und Energy, Berlin, Germany — Iron superconductors, offering the possibility to study different and yet related materials, provided an important insight into the problem of unconventional superconductivity—in particular it is becoming clear that the strong electron interaction with other electrons and with the magnetic excitation spectrum is the feature that unifies all relevant compounds from an empirical point of view. At the same time even isostructural materials, exhibiting low levels of the electronic interactions, never show high critical temperatures. I will review the electronic self energy, determined for the entire $3d$ band from the angle-resolved photoemission spectroscopy (ARPES) measurements of iron pnictides and chalcogenides of 11, 111, 122, and 1111 families in the bulk and thin film form, and will compare it to the situation in the compounds with iron substituted by other d metals. Matching ARPES data with the results of calculations for correlated systems shows detailed agreement as for the large-scale structure of the spectral function, implying that major deviations from the single-electron model are to be attributed to the electronic correlations of moderate strength. The low-energy spectral anomalies correspond well to the shape of the spin-fluctuation spectrum.

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