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Fourier transform angle-resolved photoemission. VOLODYMYR BORYSENKO, Vinnytsya State Technical University — We suggest a new spectroscopic technique, which allows to further extend the capabilities of the conventional angle-resolved photoemission spectroscopy (ARPES). Recent improvement of the energy and momentum resolution in photoemission spectroscopy has been accompanied by the rapid development of the computer-based data acquisition routines. As a result, the typical measuring time has been significantly reduced. This, in turn, allows to record the photoemission intensity from the virtually complete half-space defined by the sample surface. At the same time, the modern synchrotron radiation offers the opportunity to use higher photon energies without considerable increase of the bandwidth. Already using the 100 eV photons one can cover nearly 25 typical Brillouin zones (in a repeating zone scheme). We propose to compute a Fourier transform magnitude F ($\boldsymbol{r}$, E_b) from the measured A ($\boldsymbol{k}$, E_b) distribution. The physical meaning of the obtained characteristic length scale is discussed. This technique can be proven valuable because of its exceptional capability to relate the $\boldsymbol{k}$-space electronic structure to that in real space.

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