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Optical conductivity and Raman scattering of iron superconductors MARIA J. CALDERON, BELEN VALENZUELA, GLADYS LEON, ELENA BASCONES, Instituto de Ciencia de Materiales de Madrid, Consejo Superior de Investigaciones Cientificas, ICMM-CSIC (Spain) — Raman and optical conductivity are very useful techniques to analyze the electronic properties of strongly correlated electron systems. Optical conductivity experiments have provided very valuable information on the reorganization of the spectral weight and the opening of gaps in many materials. In cuprates the use of different polarizations in Raman scattering has allowed to disentangle the different physics of the nodal and the antinodal electronic states. The multiband character of iron superconductors complicates the analysis of their Raman and optical conductivity spectra. We discuss how to analyze the optical conductivity and Raman spectrum of multi-orbital systems using velocity and Raman vertices in a similar way Raman vertices were used to disentangle nodal and antinodal regions in cuprates. We apply this method to iron superconductors in the magnetic and non-magnetic state, including the orbital differentiation regime. We also show that the Drude weight anisotropy in the magnetic state is sensitive to small changes in the lattice structure.

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