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Multiresonance, multifrequency spectroscopy of rare-earth and transition ions in ferroelectrics. GALINA MALOVICHKO, Physics Department, Montana State University, VALENTIN GRACHEV, Physics Department, Montana State University — The usual scheme of many methods for material investigation includes an emitter of electromagnetic waves and detectors for the wave registration. Typical output of one-frequency methods is an image with a space resolution of about the used wavelength. The methods are very successful for the study of lattice structures, their transformations at phase transitions, domains etc. Another approach uses sweeping of the frequency or another external parameter: electric or magnetic field, pressure etc. Typical result of a measurement is a spectrum or a dependence of measured characteristic on the sweeping parameter. The spectra do not contain direct evidence about the space structure of a lattice or defects. However, they contain very important information about the energetic characteristics of interactions of lattice ions, intrinsic and extrinsic defects. We present results of multifrequency research of defects in oxide crystals involving optical spectroscopy, microwave and radiofrequency spectroscopy: electron paramagnetic resonance, and electron nuclear double resonance.

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