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## Selective laser spectroscopy of solids: A history, fundamentals and applications

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A history of the development of selective laser spectroscopy of solids is described, beginning from a pioneering work by Yu. V. Denisov and V. A. Kizel in 1967, who were the first to demonstrate removing the inhomogeneous broadening of luminescence spectra of ions in glasses upon monochromatic resonance excitation. Selective excitation of optical centers is achieved due to existence of very narrow homogeneous zero-phonon lines in the spectra of impurity centers in solids, which are hidden in broad inhomogeneous optical bands upon usual nonselective excitation. The fundamentals of zero-phonon transition spectroscopy are considered and the mechanism of removing the inhomogeneous broadening of optical spectra of ions and molecules in crystals and amorphous solids under selective laser excitation of luminescence and persistent hole burning in absorption spectra is analyzed in detail. Various applications of selective laser spectroscopy for fundamental and applied studies are discussed.

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