

## Use of EPR in Experimental Mechanics

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**Abstract :** An attempt to apply EPR (Electron Paramagnetic Resonance) spectroscopy to experimental analysis of the mechanical state of the loaded material is considered in this work. Theory concerns the participation of electrons in transfer of mechanical action. The model of measurement is shown by applying classical mechanics and quantum mechanics. Theoretical analysis is verified using EPR spectroscopy twice, once for the free spacemen and once for the mechanical loaded spacemen. Positive results in the form of different spectra for free and loaded materials are used to describe the mechanical state in continuum based on statistical mechanics. Perturbation of the optical electrons in the field of the mechanical interactions inspires us to propose new optical properties of the materials with mechanical stresses.

**Keywords :** Cosserat medium, EPR spectroscopy, optical active electrons, optical activity

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