Edited by Sushil K. Misra

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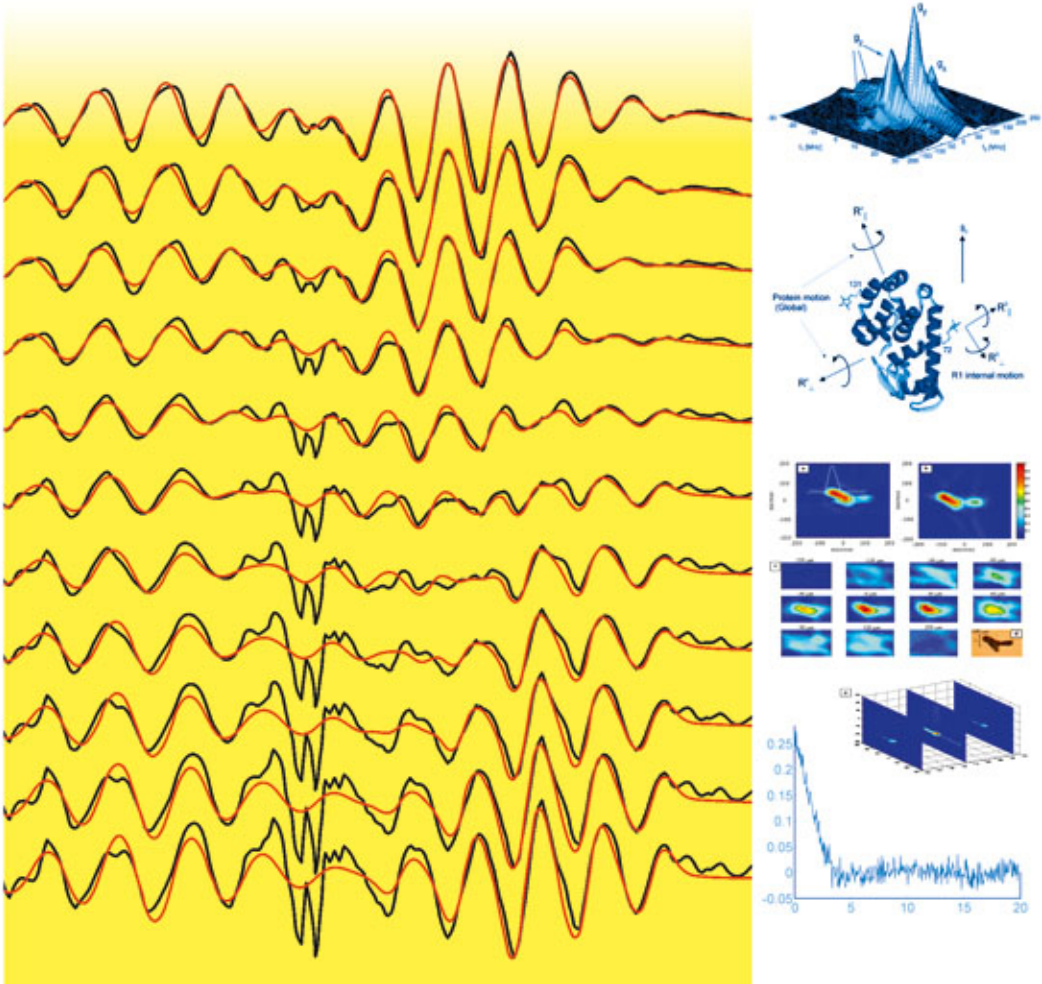
Multifrequency Electron Paramagnetic Resonance

Theory and Applications



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Details of the figures on the book cover

Left: The black traces are a set of model 1.6 GHz second-harmonic experimental EPR spectra corresponding to mixtures of 100–0% Cu(II)-imidazole and 0–100% Cu(II)-KTSM [3-ethoxy-2-oxobutyraldehyde-bis(N4-methylthiosemicarbazonato) copper(II)], respectively, over the perpendicular region and the m(I) = +1/2 parallel line. The red traces are an automated fit to the model experimental spectra using simulations of the individual components as basis spectra. The simulations provided anisotropic copper and nitrogen hyperfine terms. The fits predicted the fraction of the major component to within 5% for each mixture. The feature at 580 G is a free radical contaminant in the Cu(II)-KTSM sample.

Right, from top to bottom: (i) SECSY: Two-Dimensional EPR spectrum of a spin labeled peptide: Gramicidin, in an aligned lipid membrane near room temperature taken at 95 GHz and showing its g-tensor resolution; (ii) An illustration of the model used to analyze multifrequency EPR spectra of spin-labeled proteins, in terms of internal and overall modes of motion. (iii) EPR micro-images of a LiPc crystal: (upper) 2D microimages; (middle) a series of 2D images for different Z-slice sections, lower right image is the optical image of the LiPc crystal; (bottom) a 3D stacking of the 2D images. (iv) The time domain Pulse-Dipolar EPR signal taken at 17 GHz from an RNA/DNA duplex corresponding to a distance between spin labels of 80Å. The time evolution shown extends to 20 micro-secs.

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