provided that a resonance energy transfer to the quasiparticle excitation on a metal subsystem takes place with excitation of the mixed state of localized d(f)-orbitals of valence electrons and delocalized s(p)-electron orbitals of conduction band, or more accurately not a mixed but a generalized coherent electron state. It is shown that the electron transfer to the conduction band changes the electron configuration $d(f)^n$ on $d(f)^{n-1}$ + *e* and leads to increasing of the valence of the metal by unit. Therefore, these coordinating systems are systems with mixed valence. The long lifetime of the spin-polarized electron states of metal atoms in the obtained complexes leads to the Hanle effect, which is proposed to use in development of spintronic devices.

Light propagation in turbid media by phase-sensitive and phase-insensitive numerical methods: application to biological tissues

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Light propagation in turbid media is specifically relevant in the field of biomedical optics, as biological tissues are strongly turbid media. Diagnostic or treatment applications require information regarding the spatial distribution of optical energy. This is crucial for planning the therapeutic effect or the quality of the diagnostic images obtained. In this work we compare two numerical approaches for light propagation in biological tissues. The Monte Carlo approach provides a phase-insensitive method for light propagation. On the other hand, we implement a phase-sensitive approach based on Maxwell equations. The results of both approaches are discussed.