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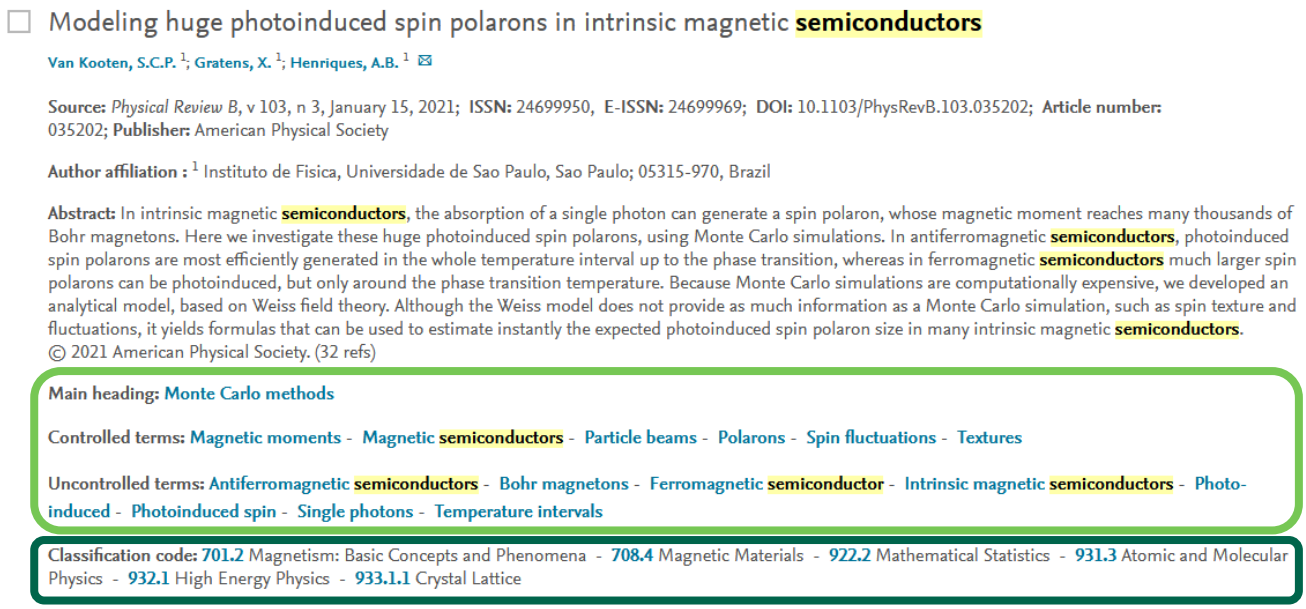

☐ Modeling huge photoinduced spin polarons in intrinsic magnetic **semiconductors**

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Abstract: In intrinsic magnetic **semiconductors**, the absorption of a single photon can generate a spin polaron, whose magnetic moment reaches many thousands of Bohr magnetons. Here we investigate these huge photoinduced spin polarons, using Monte Carlo simulations. In antiferromagnetic **semiconductors**, photoinduced spin polarons are most efficiently generated in the whole temperature interval up to the phase transition, whereas in ferromagnetic **semiconductors** much larger spin polarons can be photoinduced, but only around the phase transition temperature. Because Monte Carlo simulations are computationally expensive, we developed an analytical model, based on Weiss field theory. Although the Weiss model does not provide as much information as a Monte Carlo simulation, such as spin texture and fluctuations, it yields formulas that can be used to estimate instantly the expected photoinduced spin polaron size in many intrinsic magnetic **semiconductors**.
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Main heading: Monte Carlo methods

Controlled terms: Magnetic moments - Magnetic **semiconductors** - Particle beams - Polarons - Spin fluctuations - Textures

Uncontrolled terms: Antiferromagnetic **semiconductors** - Bohr magnetons - Ferromagnetic **semiconductor** - Intrinsic magnetic **semiconductors** - Photo-induced - Photoinduced spin - Single photons - Temperature intervals

Classification code: 701.2 Magnetism: Basic Concepts and Phenomena - 708.4 Magnetic Materials - 922.2 Mathematical Statistics - 931.3 Atomic and Molecular Physics - 932.1 High Energy Physics - 933.1.1 Crystal Lattice

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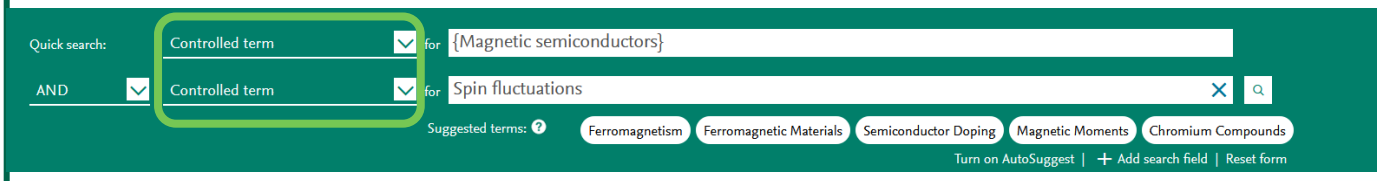

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