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Spin superfluidity, coherent spin precession and magnon BEC

Spin superfluidity, coherent spin precession, and magnon BEC are intensively investigated theoretically and experimentally nowadays. Meanwhile, clear definition and differentiation between these related phenomena is needed. Spin superfluidity is defined as a possibility of dissipation less spin transport on macroscopical distances with sufficiently large spin supercurrents. This possibility is realized at special topology of the magnetic-order-parameter space, such as, e.g., that in easy-plane ferro- and antiferromagnets, or in coherent precession states supported by pumping of energy and magnons. Recent claims on experimental observation of spin superfluidity (in yttrium-iron-garnet magnetic films, in particular) are discussed.

Biography

Edouard B Sonin is an Emeritus Professor at the Hebrew University of Jerusalem, Israel. His research interests focus on the superfluidity theory and the vortex dynamics in superfluids, superconductors, and magnetically ordered materials. He has over 230 publications including two books.

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