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Ferromagnetic reso-

nance and stress anisotropy in ferromagnetic/anti-ferromagnetic bilayer¹ GUO HONG YUN, JIAN HONG RONG, Inner Mongolia University, Hohhot PRC, DONALD SPRUNG, McMaster University, Hamilton ON — Magnetic multilayers often exhibit giant intrinsic stress due to the deposition process and the consequent increase of stress magnetic anisotropy energy. To understand the intrinsic stress of materials in order to improve their performance in applications, the effect of applied MPa uniaxial in-plane stresses on the ferromagnetic resonance (FMR) behaviour of magnetic bilayers, which consist of a ferromagnetic film coupled to an antiferromagnetic film, was investigated theoretically. The FMR modes which depend on the applied magnetic field angle, the exchange anisotropy, especially the stress anisotropy and its angle to the bilayer system, are obtained for different values of applied stress. Emphasis is placed upon understanding properties such as the positions, linewidths, and the angular dependence of the FMR frequencies and linewidths. A general theory of applied strain and stress is proposed. Comparison with previously reported theoretical results is made, and the need to measure certain physical parameters is highlighted.

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