

Fast Dynamics of Exchange Biased Bilayers

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Ultrafast optical excitation of a ferromagnet/antiferromagnet (Ni/FeF₂) exchange biased bilayer produces novel magnetization dynamics unlike ever observed before. An unexpected precession of the magnetization, in reverse magnetic fields that exceed the exchange bias, originates from a reorientation of frustrated spins at the interface. As the laser-excited interface approaches the blocking temperature, an exchange bias reversal can also be induced with a single excitation pulse, showing that not only the ferromagnet but also the anti-ferromagnet is strongly affected by the optical perturbation. This non-trivial response cannot be extrapolated from the known slow dynamics of magnetic bilayers, and provides important information on the physics of the interlayer coupling. We will contrast these measurements with our earlier studies using field pulses.

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