

Ultrafast generation of magnetic fields in a Schottky diode

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We introduce a novel scheme for the ultrafast generation of local magnetic fields in ferromagnet-semiconductor contact. The basis of our approach is to optically pump a Schottky diode with a focused, 150-fs laser pulse. The laser pulse generates a current across the semiconductor-metal junction, which in turn gives rise to an in-plane magnetic field. Specific advantages of this technique include the ability to rapidly create local fields along any in-plane direction on the sample without the need of electrical waveguides and microcoils.