

# Fast minute magnetic field coil for nanotechnology

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We designed and fabricated sub-mm-sized magnetic field coils capable of delivering fast magnetic field pulses (rise times of order of 10ns) in the plane of the sample. We use magnetic field outside the single layer coil which achieves up to 40mT in the sample plane when driven with 10A current pulses. Placement of the sample above the coil allows for easy access to its surface. The proposed design can be very useful when direct optical observation (i.e. Kerr microscopy, photospectroscopy) and/or access with manipulators is required. We validated our coil by studying magnetic domain wall dynamics in permalloy nanowires. The design is currently the subject of patent application.