

Abstract Submitted  
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**Pulsed-laser deposition of crystalline cobalt ferrite thin films at lower temperatures** DAVID JILES, ARUN RAGHUNATHAN, IKENNA NLEBEDIM, JOHN SNYDER, Wolfson Centre for Magnetism, Cardiff University, Cardiff CF24 3AA, United Kingdom — Cobalt ferrite thin films have been proposed for various engineering applications due to their exceptional magnetic, magnetoelastic, magnetotransport, magneto-optical properties. In this research, cobalt ferrite thin films were grown on SiO<sub>2</sub>/Si(100) substrates using pulsed-laser deposition (PLD) technique at substrate temperatures ranging from 250 °C to 600 °C. It has been shown in this study, that polycrystalline films with (111)-preferred orientation can be prepared at substrate temperatures as low as 250 °C, as opposed to a report of optimum 600 °C substrate temperature [1]. Thermal expansion mismatch between the film and substrate was found to have a substantial effect on the magnetic properties of the cobalt ferrite films, due to the large magnetoelastic coupling of cobalt ferrite. The growth of crystalline cobalt ferrite films at such low temperatures indicates the potential to use cobalt ferrite for MEMS devices and sensor applications [2] including integration with a wider range of multilayered device structures. This research was supported by the UK EPSRC (EP/D057094) and the US NSF (DMR-0402716). [1] J. Zhou et. al, *Applied Surface Sciences*, 253 (2007), p. 7456. [2] J. A. Paulsen et. al., *Journal of Applied Physics*, 97 (2005), p. 044502.

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