Zener model calculations of magnetic properties of (Ga,Mn)As

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(Ga,Mn)As is an important member of the material family known as ferromagnetic semiconductors which uniquely combine ferromagnetic and semiconductor properties in one system. The *p-d* Zener model of ferromagnetism in (Ga,Mn)As, in which exchange interactions between localised Mn spins are mediated by the valence band holes, has been initially proposed [1] to describe the Curie temperatures and magnetic anisotropy of epitaxial layers grown on (001) oriented substrates [2]. In this talk I will present theory developed within the *p-d* Zener model of two experimentally relevant effects: (i) magnetic anisotropy of epitaxial layers grown on (311) oriented substrates and (ii) volume magnetisation of the hole liquid that mediates the magnetic interactions [3].

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[1] T. Dietl, H. Ohno, F. Matsukura, J. Cibert, D. Ferrand, Science **287** (2000) 1019
[2] T. Dietl, H. Ohno, F. Matsukura, Phys. Rev. B **63** (2001) 195205
[3] C. Śliwa, T. Dietl, Phys. Rev. B **74** (2006) 245215

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