Abstract Submitted
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Effetcs of thickness and mass anisotropy on the spin susceptibility of the 2DEG in AlAs QWs STEFANIA DE PALO, SAVERIO MORONI, Democritos INFM-CNR, GAETANO SENATORE, Democritos INFM-CNR and Università di Trieste — It has been demonstrated that device details, such as the transverse thickness, may affect in a substanial manner the spin susceptibility of the two dimensional electron gas (2DEG) which is realized in semiconducting heterostructures [1]. An important device detail in AlAs quantum wells(QW) is an in-plane mass anisotropy [2], which even in the regime with only one valley occupied is combined with a sizeable transverse thickness. For selected values of the well width appropriate to the experiments, we evaluate the effect of such thickness and, partly, of the mass anisotropy through a mapping of the 2DEG with mass anisotropy onto an 'equivalent' isotropic 2DEG with effective mass $m^* = \sqrt{m_t m_l}$. We then critically compare our results with experimental meausurent and assess the importance of anisotropy effects that go beyond this simple minded mapping.
[1] S. De Palo et. al., Phys. Rev. Lett. 94, 226405 (2005).
[2] M. Shayegan et. al., phys. stat. sol. (b) 243, 3629 (2006)

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