

MAGNETIC PROPERTIES OF QUANTUM RINGS
IN THE PRESENCE OF SPIN-ORBIT
INTERACTION

*O.S. Bauzha, O.M. Voskoboynikov¹, O.V. Tretyak,
O.S. Sinyavskij*

Taras Shevchenko Kyiv National University
(64, Volodymyrska Str., Kyiv 01033, Ukraine),

¹Chiao Tung National University
(1001, Ta Hsueh Rd., Hsinchu 300, Taiwan)

S u m m a r y

Theoretical calculations of the influence of spin-orbit (SO) interaction on the magnetization and the magnetic susceptibility of small semiconductor quantum rings are presented. Those characteristics demonstrate quite an interesting behavior at low temperatures. The abrupt changes of the magnetization and the susceptibility at low magnetic fields are attributed to the crossing of the spin-split electron levels in the energy spectrum. The split of the levels is happened due to the SO interaction. Detailed calculations, where the parameters of an InSb semiconductor quantum ring were used, demonstrated the enhancement of the ring paramagnetism. There is also another possibility to control the effect by external electric fields.