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g-tensor evaluation in self-assembled quantum dots F.G.G. HERNANDEZ, T.P. MAYER ALEGRE, G. MEDEIROS-RIBEIRO, Brazilian National Synchrotron Laboratory — In solid state, the first term to be considered in the effective spin Hamiltonian is that representing the electronic Zeeman interaction. In a doublet state with $S = 1/2$, the two levels will diverge linearly with the magnetic field (B), with slopes $\pm 1/2 g\beta B$. In practice, the Zeeman interaction not depends only on the angle between the effective spin vector ($\overrightarrow{S}$) and $\overrightarrow{B}$ but depends also on the angle that $\overrightarrow{B}$ makes with certain axes defined by the sample symmetry. Taking into account this kind of anisotropy, the effective spin Hamiltonian is $\beta(\overrightarrow{B} \cdot \overleftrightarrow{g} \cdot \overrightarrow{S})$, where $\overleftrightarrow{g}$ is the g-tensor. Since electrons can be individually trapped into quantum dots (QDs) in a controllable manner, they may represent a good candidate for the successfully implementation of spintronics into semiconductor heterostructures. In this work we realized magneto-capacitance spectroscopy (CV) in order to obtain the localization energies and the evolution of the Zeeman splitting for the s and p electron confined levels in InAs self-assembled quantum dots (SAQDs). The CV experiments were performed at 2K using lock- in amplifiers at a frequency of 7.5KHz. An AC amplitude of 10 mV was superimposed on a varying DC bias ranging from -2 V to 0.5 V with a signal/noise ratio above 10^4. Aligning $\overrightarrow{B}$ with different crystallographic directions, we measured the g-tensor showing the existence of a high anisotropy degree. The g-factor values obtained ranges between 1.9 and 0.7, with $\overrightarrow{B} \parallel 001$ and $\overrightarrow{B} \parallel 110$ respectively.

Felix Hernandez
Brazilian National Synchrotron Laboratory LNLS

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