NMR STUDY OF A MIXED VALENCE MANGANITE $La_{0.35}Ca_{0.65}MnO_3$

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9.7 cm

A ^{55}Mn and ^{139}La nuclear magnetic resonance study of $La_{0.35}Ca_{0.65}MnO_3$ belonging to the family of manganese perovskites exhibiting a "colossal" magnetoresistance is reported. Spin echo spectra and the relaxation times were measured at temperatures 3-77K and in the applied magnetic field up to 3T. The ^{55}Mn spectra consist of two lines centred at 290 MHz and 375 MHz. The 375 MHz line shifts in the applied field towards lower frequencies according to a full gyromagnetic ratio. The 290 MHz line, exhibiting an order of magnitude lower enhancement factor, shows large broadening but only a slight shift of the central frequency. Thus, the 290 MHz line is assigned to the Mn moments in the antiferromagnetically coupled regions, whereas the 375 MHz line, similar to that obtained for the metallic and ferromagnetic $La_{0.7}Ca_{0.3}MnO_3$, is attributed to the regions of ferromagnetically coupled Mn spins. The results are discussed in terms of coexistence of superexchange and double exchange interactions in the charge ordered state of the compound and related to the compounds of a lower hole (alkaline earth) doping level.

13.4 cm

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