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SÉMINAIRE

Lundi 10 mai, 10h30

*Salle de conférence, Bâtiment 15
Campus Boucicaut, 140 rue de Lourmel, 75015 Paris*

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CRYSTALLOGRAPHIC EVIDENCE OF A COUPLING BETWEEN MAGNETIC AND FERROELECTRIC ORDER PARAMETERS IN $\text{BiMn}_7\text{O}_{12}$

Manganese oxides $\text{AMn}_7\text{O}_{12}$ ($A=\text{Na}, \text{Ca}, \text{La}$) with quadruple perovskite structure display charge, spin and magnetic orderings not observed in simple perovskites. Here we study the magnetic structure of the single-valent compounds $\text{LaMn}_7\text{O}_{12}$ and $\text{BiMn}_7\text{O}_{12}$, the quadruple perovskite counterpart of simple perovskites LaMnO_3 and BiMnO_3 , respectively. By means of a neutron diffraction study, we found that in both compounds the A' and B ions order antiferromagnetically (AFM) at low temperatures in an independent fashion. However, in spite of the common Mn^{3+} properties, the magnetic structures are strikingly different in the two compounds. In particular, in $\text{LaMn}_7\text{O}_{12}$ the structure of the B -site is of C-type, which contrasts the A-type structure reported for LaMnO_3 . On the other hand, in $\text{BiMn}_7\text{O}_{12}$, the AFM structure of the B -site is characterized by two distinct propagation vectors $(1/2, 0, 1/2)$ and $(0, 0, 0)$. We discuss the origin of these differences in terms of the polar properties of the Bi $6s^2$ lone pair, which gives a first evidence of coupling between magnetic and ferroelectric order parameters.