

Abstract Submitted  
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**Zener Polarons Ordering Variants Induced by A-Site Ordering in Half-Doped Manganites** AZIZ DAOUD-ALADINE, ISIS Department, Rutherford Appleton Laboratories, Chilton, Didcot, Oxfordshire OX11 0QX, UK, CRISTIAN PERCA TEAM, LOREYNNE PINSARD-GAUDART TEAM, JUAN RODRIGUEZ-CARVAJAL TEAM — Zener Polaron (ZP) ordering [1] provides a still polemic [2] and elusive interpretation of the charge ordering (CO) phenomenon in A site disordered half doped ( $A_{1/2}Ca_{1/2}$ )  $MnO_3$ , which is classically pictured by the Goodenough model (GM) of  $Mn^{3+}$  and  $Mn^{4+}$  CO [3,4]. ZP ordering considers instead the ordering of pre-formed ferromagnetic Mn pairs sharing an charge and keeping Mn in a  $Mn^{+3.5}$  valence state. The recently synthesized A site cation ordered  $ABaMn_2O_6$  were shown to not present the generic magnetic CE state found of ( $A_{1/2}Ca_{1/2}$ ) $MnO_3$  [5]. We present our magnetic structure determination of  $YBaMn_2O_6$ : the non- collinear magnetic order obtained unexpectedly reveals ferromagnetic plaquettes of four Mn attributable to larger 4-Mn ZPs, whose presence additionally fits very well the effective paramagnetic moments inferred from susceptibility measurements. The results unambiguously reveal the possible existence of ZP ordering variant in charge ordered manganites. [1] A. Daoud-Aladine et al., Phys. Rev. Lett. 89, 097205 (2002) [2] S. Grenier et al., Phys. Rev. B 69, 134419 (2004) [3] J. B. Goodenough, Phys. Rev. 100, 564 (1955) [4] P.G. Radaelli et al., Phys. Rev. B, 55, 3015 (1997) [5] T. Arima et al., Phys. Rev. B 66, 140408 (2002)

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