Non-Collinear Magnetic Orderings in Mott Insulators ALEXANDER BAZHAN, P.L. Kapitza Institute for Physical Problems, RAS — Non-collinear magnetic orderings of four Cu magnetic moments in Mott insulators \( \text{Rd}_2\text{CuO}_4 (R = \text{Nd, Pr}) \) of \( \text{I4/mmm} \) symmetry and associated magnetic phase transitions are of interest in studies of transformations, when correlated electron-hole carriers are introduced in \( \text{R}_2-x\text{Ce}_x\text{CuO}_4 \pm \delta \). Orderings are determined by thermodynamic potential in representation by antiferromagnetic \( l_1, l_2 \) and magnetic \( m \) vectors, with orderings of \( l_1, l_2 \) vectors along \([100], [010]\) axis, with values \( l_2^1 = l_2^0 = 1/2 l_2 \), [1], which can be presented as, \( \Phi = 1/2 A(l_1^y l_2^y + l_2^x l_2^x) + 1/2 A_3 l_2^3 + 1/2 B m_2^5 + 1/2 D [((l_1 m)^2 + (l_2 m)^2) + 1/2 D_3(l_1 m)^2 + 1/4 I(l_1^2 + l_2^2)^2 + 1/4 l_1 l_2 + 1/4 E (l_2 - l_2^1)^2 + 1/4 a (l_1^2 + l_2^2) + 1/4 a l_2^3] - 1/4 b_2 [((l_1^2 y + l_2^2 y) + (l_1^0 x + l_2^0 y))] - 1/4 b_4 [(l_1^0 y + l_2^0 y)^2 + (l_1^0 x + l_2^0 y)] - mH \) where \( l_3 = 0 \). Magnetic phase transitions, are concerned with change of \( l_1, l_2 \) values in fields \( \sim H_{c1}, \sim H_{c2} \), where \( l_2^1 = 0, l_2^2 = l_2^0 \), when field is oriented along \([100], [110]\) axis respectively, and next \( l_2 \) rotation to orthogonal to field direction in fields \( \sim H_{c2} \), when field is along \([110]\) axis. Fields \( H_{c1}, H_{c2} \) are presented as, \( H_{c1}^2 = 2B E l_0^3; H_{c2}^2 = H_{c1} H_{c2} \), if \( H_{c2}^2 = b_2 B l_0^3; H_{c2}^2 = \sqrt{2} H_{c1} H_{c2} \) if \( H_{c2}^2 = b_4 B l_0^3 \). Formation of charge density waves of checkerboard structure can be detected by studies of transformation of magnetic phase transitions and fields in \( \text{R}_2-x\text{Ce}_x\text{CuO}_4 \pm \delta \). [1]. A. N. Bazhan, AIP Proceedings 850 (2006) 1241

\(^1\)ul. Kosygina, 2, 119334 Moscow, Russia

Alexander Bazhan
P.L. Kapitza Institute for Physical Problems, RAS,