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**Site-inversion versus frustration in the  $\text{CoAl}_2\text{O}_4$  spinel: A neutron diffraction study at MURR<sup>1</sup>**

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Neutron diffraction studies of a well defined  $\text{CoAl}_2\text{O}_4$  polycrystalline sample reveal the role that site-inversion plays in determining the magnetic properties of this system. The A-B site-inversion in the spinel system is a long standing issue. In this regard  $\text{CoAl}_2\text{O}_4$  is notorious as Co-Al site-inversion can exceed 20% and, so far, could not be totally eliminated. In this talk, I will review previous reports including more recent ones that emphasize Co-Co next-nearest-neighbor coupling in the diamond-like Co sublattice that is claimed to lead to exotic spin-liquid structure or to be on the boundary of a recently predicted phase diagram between a collinear antiferromagnetic and a spiral magnetic structure. I will present the various views on the phase diagram of  $\text{CoAl}_2\text{O}_4$  as a function of Co-Al site inversion parameter and contrast them with our neutron diffraction studies.

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