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Magnetism at grain boundary interfacesin the colossal permittivity dielectric material; In+Nb Co-Doped Rutile ADAM BERLIE, ISIS Neutron and Muon Source, STFC Rutherford Appleton Laboratory, Chilton, Oxfordshire, OX11 0QX, United Kingdom., IAN TERRY, Department of Physics, Durham University, South Road, Durham, DH13LE, United Kingdom., STEPHEN COTTRELL, ISIS Neutron and Muon Source, STFC Rutherford Appleton Laboratory, Chilton, Oxfordshire, OX11 0QX, United Kingdom., WANBIAO HU, YUN LIU, Research School of Chemistry, Australian National University, Acton, Canberra, 2601, Australia. — With the emphasis in recent years on understanding novel materials with potential technological applications this work seeks to understand magnetic ordering within the colossal-permittivity material, In+Nb co-doped rutile (TiO_2). Evidence for a spin-freezing transition was reported from a step like feature in the dielectic data below 50 K but this was largly glossed over. Within this work we show that below 300 K there is a slowing down of magnetic fluctuations associated with the electronic magnetism due to the defect-dipoles created by the co-doping, but the muon spectroscopy results are strongly suggestive of the behaviour being localised to the edges/interfaces of particles/grains. The T_C is strongly dependent on the doping level of the samples that presents novel way to control the magnetism and ultimately magneto-electric coupling within a dielectric material.

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