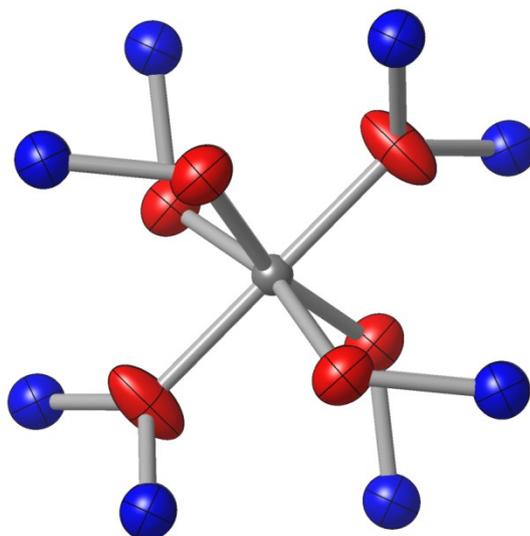
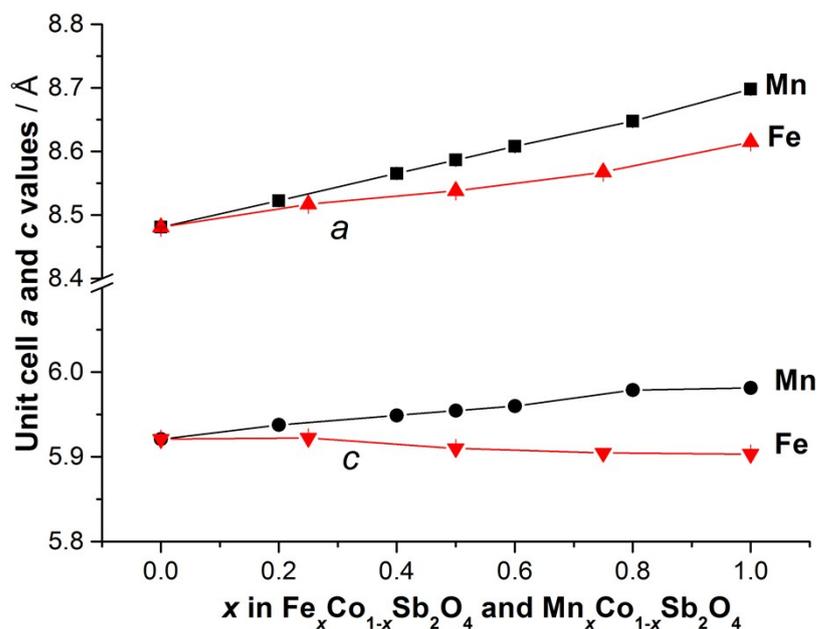


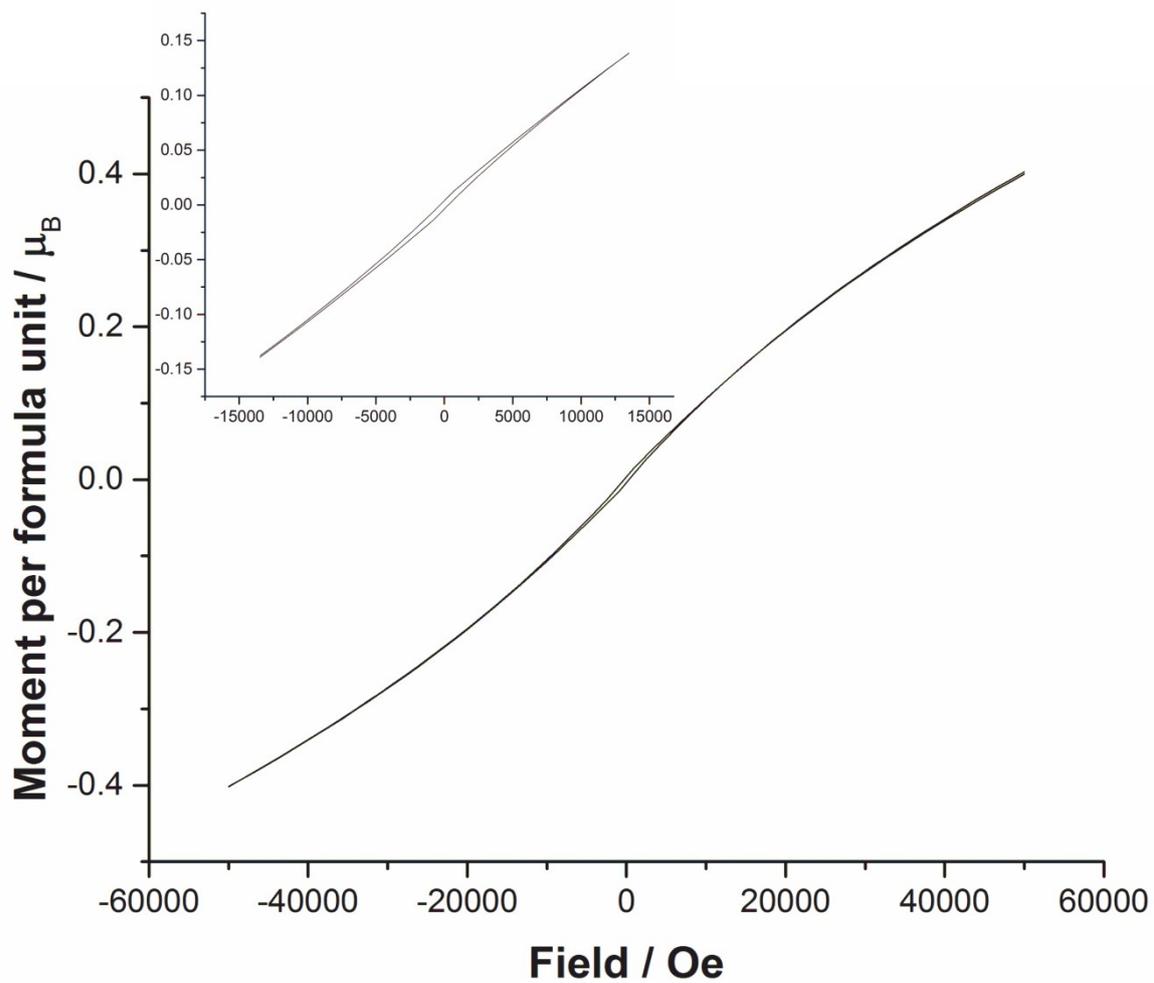
### Supplementary Information



**Fig.S1** Single octahedral chain viewed along [001] in  $\text{Mn}_{0.5}\text{Co}_{0.5}\text{Sb}_2\text{O}_4$  showing anisotropic oxygen and antimony displacement parameters (99 % probability). Mn / Co—grey sphere, Sb—blue spheres, O—red ellipsoids.



**Fig.S2** Variation of unit cell edge lengths for  $\text{Mn}_x\text{Co}_{1-x}\text{Sb}_2\text{O}_4$  and  $\text{Fe}_x\text{Co}_{1-x}\text{Sb}_2\text{O}_4$  at low temperature (2 K – 5 K). Errors are hidden by the symbols.



**Fig.S3** Induced magnetic moment per formula unit for  $\text{Co}_{0.5}\text{Fe}_{0.5}\text{Sb}_2\text{O}_4$ . The inset highlights the hysteresis observed in the low field regions.