Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

**Strong effect of low-dimensional Fe-doped cobalt niobate on a strongly ferrimagnetic system**[1] CAJETAN NLEBEDIM, Ames Laboratory, U.S. Department of Energy, DAVID JILES, Department of Electrical and Computer Engineering, Iowa State University — In this work, the first investigation of the effect of Fe-doped cobalt niobate ($CoNb_2O_6$) imbedded in the matrix of a strongly ferrimagnetic cobalt-iron oxide, is presented. The temperature dependence of the magnetic properties and how they change with variations in the concentration of $CoNb_2O_6$ is also presented. $CoNb_2O_6$ is a prototypical low-dimensional material belonging to the pyrochlore-type $AB_2O_6$ systems. Its low-dimensional magnetic characteristics can help in understanding the magnetic properties of higher order systems. It has been investigated for applications in resonators and capacitors. This work shows that the magnetization of the ferrimagnetic phase is strongly affected by the concentration of Co ions in the low-dimensional phase, below 15 K but changes in coercivity with temperature were predominantly due to the ferrimagnetic phase. The systematic variation in the concentration of both phases and the cation ratio in each phase, enable us to understand the variation of the magnetic properties with temperature. This work provides useful insights into tuning the magnetism in strongly magnetic materials with transition metal $AB_2O_6$ systems imbedded in their matrices.

[1]This work was supported by the USDoE, Office of Science, Basic Energy Sciences, Materials Science and Engineering Division. The research was performed at Ames Laboratory, operated for the USDoE by Iowa State University (contract # DE-AC02-07CH11358)

David Jiles
Dept of Electrical and Computer Engineering, Iowa State University

Date submitted: 14 Nov 2014 Electronic form version 1.4