Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Effect of Particle Size Distribution on the Magnetostrictive Properties of Cobalt Ferrite CAJETAN NLEBEDIM, DAVID JILES, Department of Electrical and Computer Engineering, Iowa State University — Magnetostrictive materials are technologically useful for developing stress sensors and actuators. Oxide based magnetostrictive materials such cobalt ferrite are more appropriate especially in situations where it is desirable to avoid losses due to eddy current. A very important factor that strongly affects the magnetostrictive properties of this class of materials is the microstructure. This study investigates the relationship between the pre-sintering particle size distribution and the magnetostrictive properties of cobalt ferrite. This is important because final microstructure, hence the magnetostrictive properties of ferrites prepared via the solid-state reaction technique will depend strongly on the pre-sintering particle size distribution. Samples derived by combining powders with the smallest and largest particle size distributions gave the highest magnetostriction amplitude and strain sensitivity for measurement in the parallel direction. Samples from the largest particle size distribution gave the least in the parallel direction but highest in the perpendicular direction.

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Date submitted: 15 Nov 2013 Electronic form version 1.4