Abstract Submitted
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**Correlating valence state, site preference and co-substitution to the magnetoelastic properties of cobalt ferrite**[1] CAJETAN NLEBEDIM[2], Ames Laboratory, U.S. Department of Energy, DAVID JILES[3], Department of Electrical and Computer Engineering, Iowa State University — Understanding how to influence the physics of magnetism, especially the relationship between magnetic susceptibility and stress, can be very useful in designing non-contact stress and torque sensors using magnetoelastic materials. This is particularly important considering that materials rarely occur in states desirable for direct applications. In this work we show that the magnetoelastic properties of cobalt ferrite are strongly dependent on the valence states and site preferences of substituted cations. It was found that co-substitution of magnetic and non-magnetic cations, is key to achieving simultaneous improvement in magnetostriction amplitude and strain sensitivity to applied magnetic field. Nevertheless, Curie temperature decreased, irrespective of the valence state, site preference or co-substitution. This presentation will show why tetravalent Ge resulted in superior magnetostrictive properties compared to other tetravalent, trivalent and divalent cations substituted into the crystal lattice of cobalt ferrite.

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[2]Also affiliated to the Department of Electrical and Computer Engineering, Iowa State University
[3]Also affiliated to Ames Laboratory, U.S. Department of Energy

Cajetan Nlebedim
Ames Laboratory, U.S. Department of Energy

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