Abstract Submitted
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Independent component analysis of inhomogeneous broadening in perturbed angular correlation spectroscopy[1] MICHAEL STUFFLEBEAM, JEFFERY A. HODGES, TYLER PARK, W. EVENSON, P. MATHESON, Utah Valley University, M.O. ZACATE, Northern Kentucky University — Independent component analysis (ICA) of electric field gradient (EFG) tensor components has proven useful in analysis of inhomogeneous broadening in perturbed angular correlation (PAC). We have simulated PAC spectra for various concentrations (0.1% to 15%) of randomly distributed defects with a near- neighbor vacancy in simple cubic and face-centered cubic crystal structures. In analyzing this simulation, we used ICA to transform the V_{xx} and V_{zz} EFG components to find a joint probability distribution function for the EFGs. ICA allowed us to separate the components and develop the joint probability function as a product of the probability distributions for two independent coordinates. Then we found the broadened $G_2(t)$ by integration over the joint probability distribution function. We have compared these results to simulated $G_2(t)$ functions, allowing us to analyze the concentration dependence of the broadened PAC spectrum. This work will be applied initially to broadened PAC data from β-Mn, Al-doped β-Mn, and Sr_2RuO_4.

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William Evenson
Utah Valley University (retired)

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