

Abstract Submitted  
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**Entanglement of nuclear spins and phonons in ideal solids.**  
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CUNY-Brooklyn College — We investigate quantum many-body dynamics of nuclei in solids, in particular as they are affected by dynamical excitations of the underlying matrix, i.e. phonon modulation of dipolar couplings. Our recent work documented consequences of this coupling in calcium fluoride, where small changes in the spectrum of the free induction decay (FID) were measured, roughly consistent with theoretical estimates based on a simplified elastic model. Such theory also predicts temperature dependent enhancement of the diffusion constant of dipolar order, essentially due to growth in the phonon mean-free path.

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