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Giant Two-Phonon Raman Signal from NbC Coherent Precipitates in Niobium JOHN ZASADZINSKI, CHAOYUE CAO, Illinois Institute of Technology, RUNZHE TAO, ROBERT KLIE, University of Illinois Chicago, LANCE COOLEY, Fermi National Accelerator Laboratory — High purity Nb, subjected to the processing steps used in SRF cavity fabrication, has been shown to reveal nanoscale NbC precipitates near the surface that are coherent with the host Nb matrix. Raman backscattering from such regions reveal spectra similar to the earlier work on bulk NbC but with a strongly enhanced two-phonon signal. The unprecedented strength and sharpness of the two phonon response has allowed a direct comparison to *ab initio* calculations of the phonon dispersion curves of NbC under uniform compression where it is shown directly that the two phonon signal originates in the regions of strong electron-phonon renormalization. The strong two phonon signal may indicate an enhancement of the electron phonon spectral function, $\alpha^2 F(\omega)$

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