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**Absence of Broad  $G^-$  Feature in Resonant Raman Spectra of Armchair Carbon Nanotubes** E.H. HAROZ, W.D. RICE, J. KONO, Department of Electrical & Computer Engineering, Rice University, J.G. DUQUE, C.G. DENSMORE, S.K. DOORN, Center for Integrated Nanotechnologies, Los Alamos National Laboratory — Unlike the radial breathing mode in carbon nanotubes (CNTs), the G-band Raman feature does not display a strong frequency dependence on nanotube structure. The appearance of a broad  $G^-$  peak in CNT Raman spectra has been attributed to numerous phenomena including the presence of metallic nanotubes, although a consensus has yet to be achieved amongst researchers. Here, we present resonant Raman measurements on macroscopic ensembles enriched in armchair CNTs produced by density gradient ultracentrifugation. Our G-band data clearly show that the broad, lower-frequency  $G^-$  mode is absent for armchair structures, in contrast with recent theoretical and experimental results, and only occurs with resonance of non- armchair metals. This forms a generalized correlation between G-band lineshape and nanotube structure due to the sampling of a large number of nanotubes of several armchair species.

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