Low Frequency NQR using Double Contact Cross-relaxation

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A cross-relaxation technique is described which involves two spin contacts per double resonance cycle. The result is an improvement in signal to noise ratio particularly at low frequencies. Experimental spectra and analyses are presented: ^{14}N in ammonium sulphate showing that the technique gives essentially the same information as previous studies; ^{14}N in ammonium dichromate determining e^2Qq/h as (76±3) kHz and η = 0.84±.04; ^{7}Li in lithium acetylacetonate for which the spectrum (corrected for Zeeman distortion) yields e^2Qq/h = (152 ±5) kHz and η = .5 ±.2. Calculated spectra are presented to demonstrate the η dependence of the line shapes for ^{7}Li.

Key words: NQR; ^{14}N; ^{7}Li; Low Frequency; Double Resonance.