

# Pure NQR Quantum Computing

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It is shown that pure NQR can be utilized as a platform for quantum computing without applying a high external magnetic field. By exciting each resonance transition between quadrupole energy levels with two radio-frequency fields differing in phase and direction, the double degeneracy of the spin energy spectrum in an electric field gradient is removed. As an example, in the case of  $I = 7/2$  (nuclei  $^{133}\text{Cs}$  or  $^{123}\text{Sb}$ ) the energy spectrum has eight levels which can be used as three qubits.

*Key words:* NQR; Quantum Computing; Zeeman Effect.