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Nota di contenuto	Introduction -- Longitudinal Relaxation in Solid 129XE -- Dipolar and Exchange Coupling Between Carrier Pairs in Disordered Semiconductors Undergoing Resonance -- Low-Frequency Modulation of Longitudinal Field: Modified Rabi Envelopes.
Sommario/riassunto	This thesis describes longitudinal nuclear relaxation measurements of solid 129Xe near 77 K with previously unattainable reproducibility, and demonstrates differences in relaxation, dependent upon the way in which the solid is condensed. These results are directly applicable to the generation and storage of large quantities of hyperpolarized 129Xe for various applications, such as lung magnetic resonance imaging (MRI). The thesis features a sophisticated theoretical approach to these data sets, including modifications to a well-established Raman-phonon scattering theory that may explain the larger scatter in and

discrepancies with previous work.