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Precision Lifetime Measurements of Excited States in ^{38}Si[1] M. GRINDER, H. IWASAKI, R. ELDER, J. ASH, A. REVEL, N. KOBAYASHI, D. BAZIN, J. BELARGE, P. BENDER, B. ELMAN, A. GADE, C. LOELIUS, B. LONGFELLOW, E. LUNDERBERG, D. WEISSHAAR, K. WHITMORE, Michigan State University/NSCL, T. HAYLETT, University of York, T. MIJATOVIC, Ruder Boskovic Institute, A. DEWALD, S. HEIL, M. MATHY, Institut fur Kernphysik der Universitat zu Koln — The nuclear shell structure significantly evolves in the neutron-rich region at the traditional magic numbers N=20 and 28, resulting in rapid shape transitions as predicted by shell model calculations. The energy ratios between the first 2^+ and 4^+ states in the even-even Si isotopes from N=20 to 28 suggest a variety of collectivity evolving from vibrational, to possible triaxial, to rotational modes. The systematic behavior of the level schemes along the Si isotopic chain suggests ^{38}Si as the turning point in this transition. The lifetime measurement of ^{38}Si was performed at the National Superconducting Cyclotron Laboratory based on the Recoil-Distance Method using the Gamma-Ray Energy Tracking In-beam Nuclear Array (GRETINA). The data are used to extract the B(E2) ratio which provides a useful measurement to assess the nature of collective modes.

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