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Precision Lifetime Measurements of Excited States in ^{38}Si and ^{36}Si[1] MARA 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 Univiversity/NSCL, T. HAYLETT, University of York, T. MIJATOVIC, Ruder Boskovic Institute, A DEWALD, S. HEIL, M. MATHY, Institut fur Kernphysik der Universitat zu Koln — Rapid shape transitions are predicted by shell model calculations as a result of the nuclear shell structure significantly evolving in the neutron-rich region at the traditional magic numbers N=20 and 28. 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 measurements of ^{38}Si and ^{36}Si were 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) ratios which provide useful measurements to assess the nature of collective modes.

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