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Low-temperature Resonant Ultrasound Spectroscopy on Alpha-Pu SAMI EL-KHATIB, New Mexico State University, H. NAKOTTE, New Mexico State University, A. MIGLIORI, Los Alamos National Laboratory, H. LEDBETTER, Los Alamos National Laboratory, J. BETTS, Los Alamos National Laboratory, S. HARRINGTON, Los Alamos National Laboratory — We measured the elastic constants of polycrystalline Alpha-plutonium (16 atoms per unit cell) as a function of temperature (18-350K) using Resonant Ultrasound Spectroscopy[1]. A smooth behavior in the temperature dependence of the elastic moduli curves is found, with no evidence for any electronic, magnetic or structural phase transitions. The data can be fit by the quasiharmonic Einstein-oscillator model. The high-temperature bulk modulus yields an anharmonic Grüneisen parameter gamma of 5.1, and the low-temperature elastic constants results a Debye temperature Θ_D of about 205K[2]. [1] Albert Migliori and John Sarrao, "Resonant Ultrasound Spectroscopy," John Wiley & Sons, INC 1997 [2] A. Migliori, H. Ledbetter, J. Betts, M. Ramos, S. Harrington, and S. El-Khatib, to be submitted to Physical Review B, 2004

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