PRECISE DETERMINATION OF INITIAL SOLAR SYSTEM $^{87}Sr/^{86}Sr$ AND IMPLICATIONS FOR EARLY SOLAR SYSTEM CHRONOLOGY. R. Parai[1] and S. B. Jacobsen[1], [1] Department of Earth and Planetary Sciences, Harvard University, 20 Oxford St. Cambridge, MA 02138, USA (parai@fas.harvard.edu).

Introduction: Sr model ages provide constraints on early solar system chronology. The timing and duration of condensation events from the solar nebula, and of subsequent differentiation of planetary bodies are of particular interest. Model age uncertainty depends partly on the precision in the initial solar system $^{87}Sr/^{86}Sr$ ratio. Here we measure $^{87}Sr/^{86}Sr$ ratios in a variety of solar system materials: calcium-aluminum inclusions (CAIs) extracted from the CV3 carbonaceous chondrite Allende, lunar anorthosite 60025, angrites and eucrites. Instrumental techniques have improved greatly in the past decade. New precise determinations of the initial solar system $^{87}Sr/^{86}Sr$ value will allow us to better resolve the timing of early solar system events.

Samples: Earlier studies used the Basaltic Achondrite Best Initial (BABI) $^{87}Sr/^{86}Sr$ value [1] as an estimate for the initial solar system $^{87}Sr/^{86}Sr$ ratio. However, CAIs extracted from Allende exhibit initial $^{87}Sr/^{86}Sr$ ratios significantly lower than BABI [2], indicating a solar system initial value that is also lower than BABI. SJ101 is a large forsterite-bearing Type B CAI extracted from Allende [3] that will be studied for Sr isotopic composition.

Angrites are also characterized by initial $^{87}Sr/^{86}Sr$ ratios lower than BABI [4-7]. Angrites are highly depleted in volatile elements and thus exhibit extremely low Rb/Sr ratios. Consequently, angrites are thought to preserve primitive $^{87}Sr/^{86}Sr$ compositions over time, as radioactive decay of ^{87}Rb has a minimal effect on $^{87}Sr/^{86}Sr$ ratios. Lunar anorthosite 60025 is likewise characterized by low Rb/Sr ratios, and exhibits the lowest $^{87}Sr/^{86}Sr$ of any lunar rock [8]. The initial strontium isotopic compositions of lunar anorthosites are similar to or lower than BABI [8-10].

CAIs from Allende, angrites, lunar anorthosite 60025 and eucrites will be analyzed for strontium isotopic composition in order to determine the initial solar system $^{87}Sr/^{86}Sr$ with better precision than previous studies.

Analytical Methods: Sr isotopic analyses are carried out on an Isoprobe-T thermal ionization mass spectrometer internally normalized to $^{88}Sr/^{86}Sr$ to correct for instrumental fractionation. Measurements will also be made with a double-spike isotope dilution technique to determine the mass-dependent Sr isotope fractionation in the samples. Precise measurements of $^{84}Sr/^{86}Sr$ will be done to identify possible nucleosynthetic anomalies.

References: [1] Papanastassiou D. A. and Wasserburg G. J. (1969) *EPSL, 5,* 361-376. [2] Gray C. M. et al. (1973) *Icarus, 20,* 213-219. [3] Petaev M. I. and Jacobsen S. B. (2008) *LPS XXXIX*, Abstract #1833. [4] Papanastassiou D. A. (1970) Thesis, California Inst. Tech. [5] Wasserburg G. J. et al. (1977) *EPSL*, 35, 294-316. [6] Lugmair G. W. and Galer S. J. G. (1992) *GCA*, 56, 1673-1694. [7] Tonui E. K. et al. (2003) *LPS XXXIV*, Abstract #1812. [8] Papanastassiou D. A. and Wasserburg G. J. (1978) *GRL*, 5, 595-598. [9] Nyquist L. E. et al. (1973) *Proc. 4th Lunar Sci. Conf.*, 567-569. [10] Carlson R. W. and Lugmair G. W. (1988) *EPSL*, 90, 119-130.