GEOCHEMICAL STRATIGRAPHY OF THE 79001/2 CORE, VAN SERG CRATER, APOLLO 17 Randy L. Korotev, Dept. of Earth & Planetary Sciences and McDonnell Center for the Space Sciences, Washington University, St. Louis, MO 63130.

A description of the core as well as data on composition and maturity of 36 samples from the upper section, 79001, of the double drive tube collected at Van Serg Crater, Apollo 17 were presented in Korotev, Morris, and Lauer (1987) [1]. For the present work, compositional data for 59 samples from the lower section of the core, 79001, were obtained. These 95 samples represent every half-centimeter (nominal) dissection interval of the 47 cm core. Magnetic data of Morris and Lauer for 79001 are presented in [2].

Stratigraphic profiles for some elements are given in Fig. 1. Much of the scatter results from small-scale heterogeneity expected for subsamples of only 50 mg in mass. Despite this noise, some stratigraphic features are still clearly discernable in the data. Most of these can be associated with variation in the proportion of the various rock-type components of the soil. Apollo 17 soils are modeled well as mixtures of high-Ti mare basalt, orange glass (74220), noritic melt rock, and anorthositic gabbro [3,4,5]. Quantitative modeling of these data is hampered by a lack of data for some key major elements (Al, Mg, Ti), but each of the four components has a characteristic trace-element signature that allows for some less well-constrained modeling to be done.

The average composition of the 79001/2 core is reasonably well explained by a mixture of 43% mare basalt, 25% orange glass, 12% noritic breccia, and 21% anorthositic gabbro. Highs in Fe and Sc concentrations occur at approximately 25-30 cm, 35-38, and 42 cm. These undoubtedly result from an increase in the proportion of mare components. Preliminary modeling suggests that the proportion of orange glass is relatively constant throughout the core and that the highs in Fe and Sc represent highs in the proportion of mare basalt. Lows in the Fe and Sc concentrations, which are correlated with highs in the La/Sm ratio, occur at 31-34 and 44-46 cm; these result from increases in the ratio of nonmare to mare material. A distinct increase in the concentrations of incompatible trace elements (e.g., La) occurs below 44 cm. This most likely results from an increase in the fraction of noritic melt rock or some other KREEP-like component. This peak is accompanied by a peak in the Na/Eu ratio. A similar peak in the Na/Eu ratio at 10-14 cm has no corresponding peak in La concentrations; it appears to be caused by a low in the Eu concentrations. Three of the model components have Eu concentrations around 1.8 ppm; anorthositic gabbro is distinctly lower at 0.8 ppm [4,5]. Lows in the Eu profile at 10-14 cm and 32-35 cm are accompanied by lows in the Fe and Sc profiles, suggesting that these are indeed caused by an increase in the proportion of a felsic, low-Eu component such as anorthositic gabbro or anorthosite.

The Sc and La profiles each suggest a discontinuity at the break between the core sections. The Ni profile, an indicator of the amount of meteoritic material, shows a minimum in the center of the core.

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GEOCHEMICAL STRATIGRAPHY IN 79001/2
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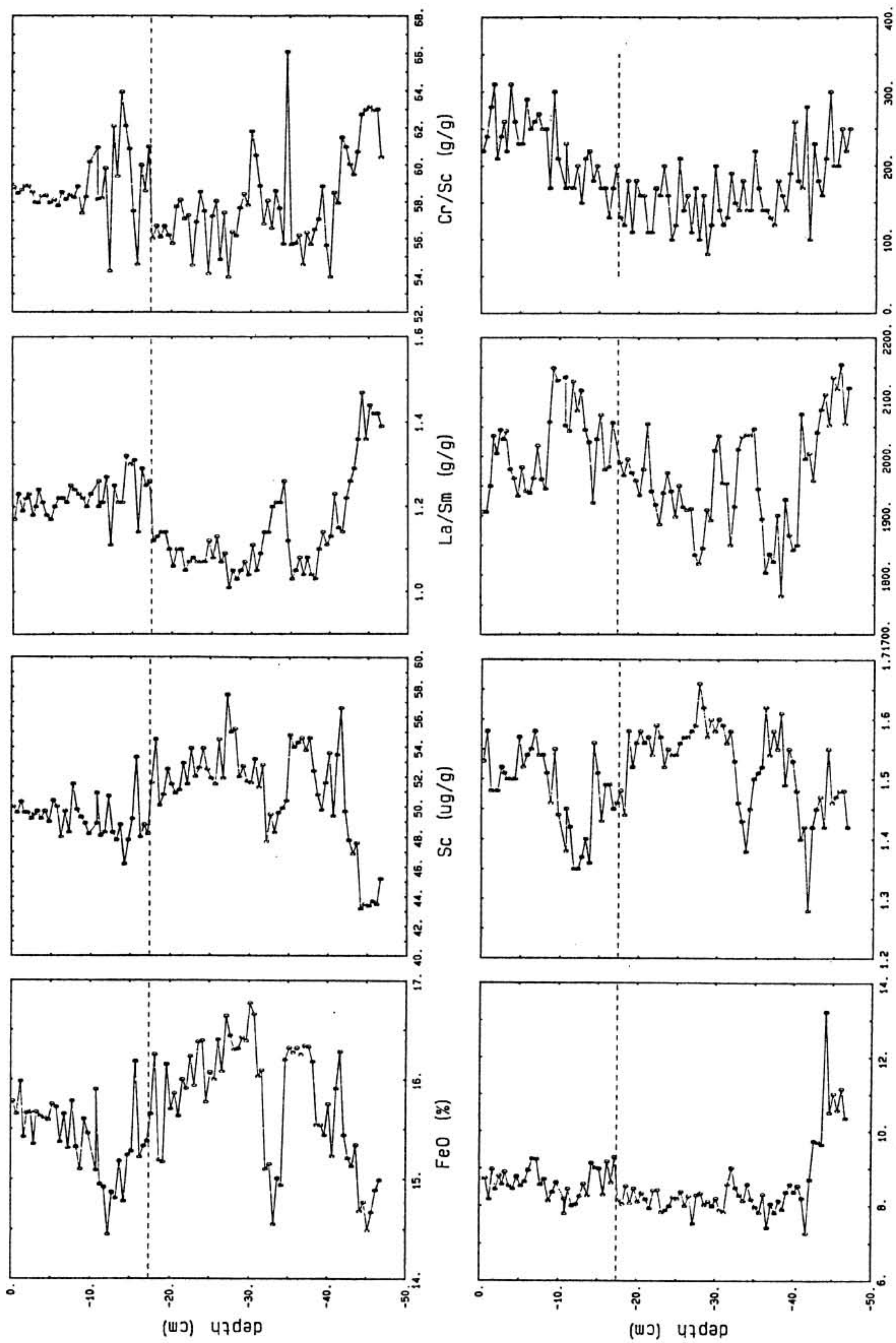

Figure 1. Profiles for some elements and ratios in 79002 (above dashed line) and 79001 (below dashed line).