VARIATION OF ^{222}Rn TO ^{210}Po ACTIVITY RATIO ON THE LUNAR SURFACE AS OBSERVED BY THE ALPHA PARTICLE SPECTROMETER; P.J. Bjorkholm, American Science and Engineering, Cambridge, MA, 02139 and P. Gorenstein, Center for Astrophysics, Harvard College Observatory/ Smithsonian Astrophysical Observatory, Cambridge, MA, 02138.

Papers presented at the Fourth Lunar Science Conference by Bjorkholm et al[1], and Gorenstein et al[2], reported the detection of areas on the lunar surface characterized by ^{222}Rn activity or by ^{210}Po activity. The detector was the Alpha Particle Spectrometer aboard the command/service module of Apollo 15 and Apollo 16. ^{210}Po is a descendent of ^{222}Rn and has an effective half life of 21 yr. The areas of the Moon having the strongest activity are the crater Aristarchas, the crater Grimaldi, and the edges of many lunar maria with Mare Fecanditatis and Mare Crisium showing the strongest signals among those observed.

We hypthesize that the emanantion of ^{222}Rn is characterized by a strong time dependence. If this is correct then the ratio of $^{222}Rn/^{210}Po$ activity will not be equal to its equillibrium value of approximately one-half and will show differences from one lunar region to another. To test this hypothesis we have examined the activity ratio at various locations on the lunar surface. We find that it varies from greater than 2.2 at Aristarchas to less than 0.4 at the edges of Mare Fecanditatis. This result supports the idea that ^{222}Rn is being released episodically at various locations on the Moon.

(1) P. Bjorkholm, L. Golub, and P. Gorenstein, Proc. Fourth Lunar Science Conf., Geochim., Cosmochim. Acta. Vol. 3 2793 (1973).

(2) P. Gorenstein, L. Golub, and P. Bjorkholm, Proc. Fourth Lunar Science Conf., Geochim., Cosmochim. Acta. Vol. 3 2803 (1973).