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LUNAR DUST MITIGATION AND CONTROL: AIR LOCK METHODS TO/FROM LIVING SPACE; ROTATING AND RECIPROCAL MACHINE LONGEVITY; SAFE DURATION OF EXPOSURE A METRIC SOUGHT

Abstract

Levitated Dust Modelling: Equations for a model has an electronic basis of being an astro-capacitor having a resistance the source of constant charging by cosmic rays to today's value from when the process began.

1 Model Constraints: 1.1 As•Is, Onsite Composition: C=Reactance in mho's, R=Resistance in ohm's, Breakdown Frequency Range, Density by Mineral, Grains: Charge/cc, Isotopes, Ambient Item Charge=q, Thermal "Contraction" .

1.2 Levitated Composition: Density: Charge Inversion by Elevation 1.2.1 High C, reactance, grains hold a minimum charge. 1.2.1.1 Held apart in a reducing density cloud organized by gravity. 1.2.1.1.1 Ambient Charge: -100vdc Interior, Near Surface Days, Debye to Ambient Nights 1.2.1.2 Debye Sheath as a Plasma: Conversion of GCR, SEP Plasma Tail to Charging Current 1.2.1.2.1 Van der Waals Radius EMF Noise Geostatics 1.2.2 Drawing Power Direct Harmonic Biasing 1.2.2.1 Resistance: Low Reactance, Resistive Grains, the main source of constant charging allows drawing power with R•C filters. 1.2.3 Low R, High Density Grains 1.2.3.1 Problematic, possibly in picograms, able to penetrate skin, many grains with the same abrasiveness as larger.

1.3 Isotopes 1.3.1 http://periodictable.com/Isotopes /020.46/index.prod.html Calcium also has a cosmogenic isotope, radioactive 41Ca, which has a half-life of 102,000 years. Unlike cosmogenic isotopes that are produced in the atmosphere, 41Ca is produced by neutron activation of 40Ca; [34, 37, 39-44, 46, 48-50] 2 EVA Systems: Dust Management 2.1 Air Locks: On-Entry: Levitated grains fill the chamber as a fluid would, density below 30m/100ft 20k-grains/cc night, days 10x higher, less charge compacts it. The ambient layer remains above grains interacting with photons, UV, solar wind at -100vdc, interior appears equal long term. 2.1.1 First Lock: Suit Room: Mist section to clean suits they stay, little abrasion, ionic bonding to remove grains, water recycled using algae to use up the minerals, remove CO2 and add O2. 2.1.2 Second Lock: Dehydration, suit liner changing, static pulse on entry/exit with air jet assist hatch open/close cycles into living/work space. 3 Model Boundaries 3.1 Lower Boundary, the Debye Sheath, acts as a plate of the capacitance to the levitated layer of like-charged grains in masses down to picograms. 3.2 Minimum Distance: By charge and weight, the gap between grains 6nm, used to evaluate each mineral separately by dielectric, resistive or insulative properties. 3.3 Repulsive Structure: The basic geometry in gravity is a vertical icosahedron between equal masses which begin at molecular diameters, all in constant motion.