

2.2.3 THE LONG TERM POPULATION OF INTERPLANETARY MICROMETEORIDS

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Three problems will be discussed: A) The relationship between micro-meteoroids and solar flare particles averaged over the recent geologic past (~ 1 my); B) the past record of this relationship as measured in lunar soils and lunar and meteoritic breccias; C) the determination of the time at which different extraterrestrial samples were exposed to free space. Data bearing on these points obtained from studies of special lunar rocks and from measurements on individual crystals removed from lunar cores will be presented. Progress in using ion-probe mass spectrometry to link measurements of micro-impact craters with the past properties of the solar wind will also be discussed. Comparing microcraters and solar flare tracks in individual crystals from lunar cores, we find no evidence of any extraordinary variations for a time span covering an interval of $\sim 10^9$ yrs. Crystals 100μ to 400μ in size in mature lunar soil samples appear to have been exposed to free space at the top of the lunar regolith for times from 10^3 to 10^4 yrs.