UPDATING THE LUNAR CRATERING CHRONOLOGY MODEL: CORRECTION OF THE ANCHOR AGES.

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The lunar surface provides one of the best-preserved impact cratering records in the inner Solar System. This record has been investigated for decades [1-9] as it is of vital importance in order to understand the bombardment history of the inner Solar System, including possible changes of the impact rate over time, the source of the impacting projectiles, the delivery of volatiles and high siderophile elements to the terrestrial planets and the abundance of Near Earth Objects and by implication the orbital evolution of the planetary system.

The currently used crater production functions [7-9] are associated with a cratering chronology model (CM) which enables the age determination of planetary surfaces where the cumulative crater frequency is known. The shape of the CM is based on calibration points from each Apollo and Luna missions landing sites [4]. The absolute ages of Apollo and Luna samples associated with these age-anchors were related to possible source units on the lunar surface and their ages compared to local crater densities. Many of these absolute ages were acquired using the ^{40}Ar-^{39}Ar dating method during the 1970's and 80's. Since then, the value of two of the main parameters used to calculate the absolute ages have been updated: the potassium (K) decay constant [10-12], as well as the age of the most used age-monitor samples [12-15]. Preliminary age correction of several Apollo samples by [16] lead to an age increase of 1-2%. The actual percentage in the age correction depends on the combination of the decay constant correction and the updated age of the age-monitor used for the irradiation of the samples analysed. Thus, the correction is a case by case situation and not a general single value that can be applied to all samples. The correction of the Apollo and Luna ages will enable an improved reconstruction of the bombardment chronology after the formation of the Earth-Moon system. Preliminary results suggest a less intensive and possibly slower impact flux decay. Some of the updated data and cratering statistics will be presented at the meeting.

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