

TERRESTRIAL IMPACT CRATERING CHRONOLOGY II: PERIODICITY ANALYSIS WITH THE 2002 DATABASE

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We examined the hypothesis that the crater formation rate exhibits periodicity, employing data sets of Grieve (1991), Moon et al. (2001), and the Earth Impact Database (2002; DB02). DB02 is known to supercede previous compilations in terms of its accuracy and precision of the ages; it is the first time that this database has been used for periodicity analysis. For data sets comprising impact structures with $D \geq 5\text{km}$ (and also those with $\geq 20\text{km}$), there is no convincing evidence for periodicities in the crater ages, according to our Fourier analysis. However, we detected two peaks at 16.1Myr and 34.7Myr for craters with $D \geq 30\text{km}$; we confirm that the age distribution of impact craters with $D \geq 45\text{km}$ has dominant power at 16.1Myr. Thus, we may conjecture a probable periodic shower of Earth impactors with sizes $d \geq 1.5\text{km}$. In addition, we found that the selection of data sets, the lower limits on the ages and diameters of impact craters, as well as the accuracy and precision of the ages, all constitute crucial factors in reconstructing the impact cratering history of the Earth.