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Synchronizing the Rock Clocks of Earth history

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The Geological Time Scale is calibrated by independent radio-isotopic and astronomical dating. These techniques yield discrepancies of $\sim$1.0%, limiting our ability to reconstruct Earth history. To overcome this fundamental problem, we compared astronomical and ^{40}Ar/^{39}Ar ages of tephras in marine deposits in Morocco to astronomically calibrate the age of Fish Canyon sanidine (FCs), the most widely used standard in ^{40}Ar/^{39}Ar geochronology. This calibration results in a much more precise and accurate older FCs age of 28.201 $\pm$ 0.023 Ma[1] and reduces the ^{40}Ar/^{39}Ar methods absolute uncertainty from $\sim$1.5 to $\leq$ 0.15%. Our results also validate intercalibration of the ^{40}Ar/^{39}Ar and U/Pb geochronometers, and afford significantly improved age resolution for Earth and planetary history.