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# Intercalibration of geochronometers: contributions from the P/E and K/P boundaries

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Despite improvements in $^{40}Ar/^{39}Ar$ dating that have resulted in ages routinely accompanied with relative analytical uncertainties of a few tenths of a percent, considerable uncertainty persists as to "absolute" age calibration as derived from first principles and intergeochronometer calibrations. Long term reproducibility of $^{40}Ar/^{39}Ar$ ages and intercalibration of various $^{40}Ar/^{39}Ar$ standards likewise have been shown to vary within a few percent, although interlaboratory variations may be significantly greater. As variation in the "absolute" age of commonly used $^{40}Ar/^{39}Ar$ dating standards remains between one and three percent, Earthtime Ar geochronologists in 2005, proposed an interim solution, by reporting $^{40}Ar/^{39}Ar$ ages relative to Fish Canyon Sanidine at 28.02 Ma. However, 1) multiple geochronometer (e.g. U-Pb, $^{40}Ar/^{39}Ar$) intercalibrations as well as astronomically derived ages for the Neogene indicate a greater age for Fish Canyon Sanidine and 2) current ages for the Paleogene and older parts of the timescale are not in sync with the primarily astronomically calibrated Neogene. Recently proposed astronomically calibrated ages for the Paleocene, P/E (Westerhold et al., 2007) and K/P (Runnegar et al., 2007) boundaries, in conjunction with new $^{40}Ar/^{39}Ar$ ages can be used to delimit astronomical cycles for the Paleocene and, in turn, the astronomical tuning can be used to refine the age and uncertainty of standards used to derive the $^{40}Ar/^{39}Ar$ ages. Results for the P/E and K/P are consistent with ages derived for the Fish Canyon Sanidine based on direct intercalibration with the astronomically tuned Neogene A1 Ash (Faneromeni) by Kuiper et al. (2005) and others. Results indicate about a 1.2 percent underestimate in the age of the Paleocene compared with the Neogene in the BKSA 1995 timescale, about 0.5 percent for the

GTS 2004 timescale and about 0.5 percent for Fish Canyon Sanidine.