Re-evaluation of the astronomically calibrated FC sanidine age

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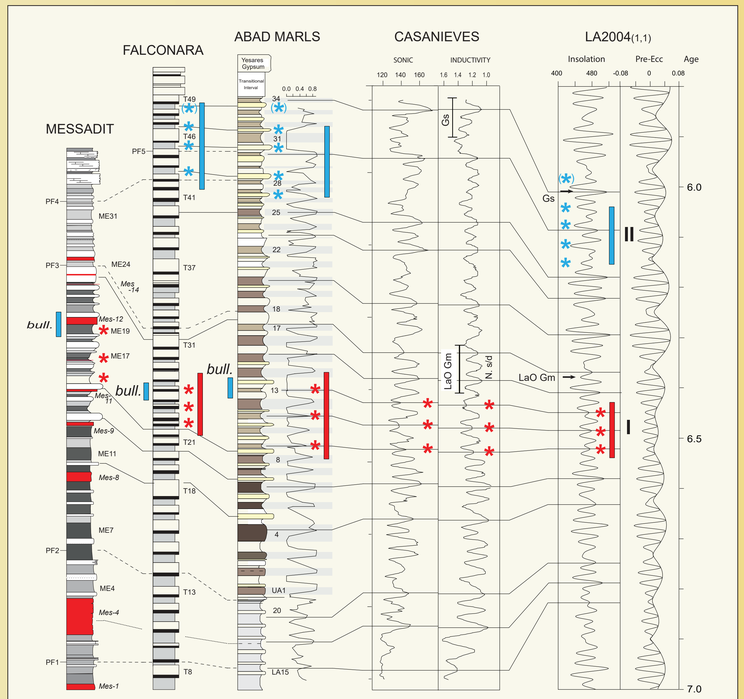
Introduction

We started the re-evaluation of the astronomically calibrated FCs age of 28.201 ± 0.046 Ma[1] by checking the tuning of the upper Miocene sections in the Mediterranean on which this age is based (Fig. 1). No indications were found for an error in this tuning. In addition, we carried out a statistical test of the tuning, using a new quantitative proxy record (see TEST 1). Finally, we provided new single crystal U/Pb zircon CA-ID TIMS ages, both for the Fish Canyon tuff and the K/Pg boundary interval (TEST 2).

Figure 1



TEST 1: Statistics

The statistical test used the sonic record of the Casanieves borehole, the tuning of which is shown in Figure 2. The outcome of this test validates the original tuning and is in less good agreement with alternate tunings that are consistent with alternatively published FCs ages[2,3] (Fig. 3).

Figure 2

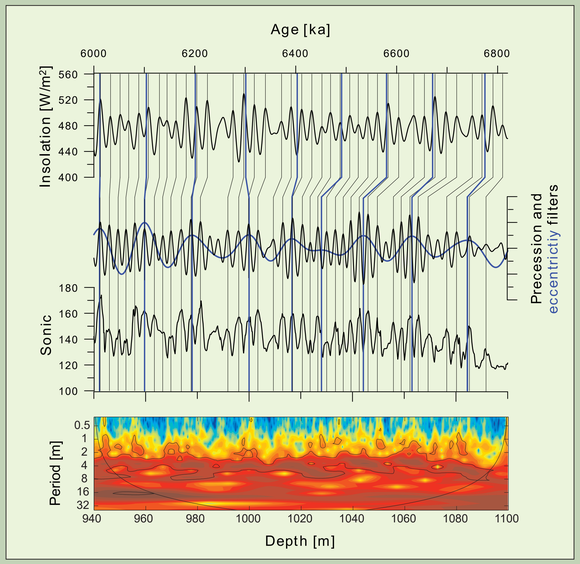
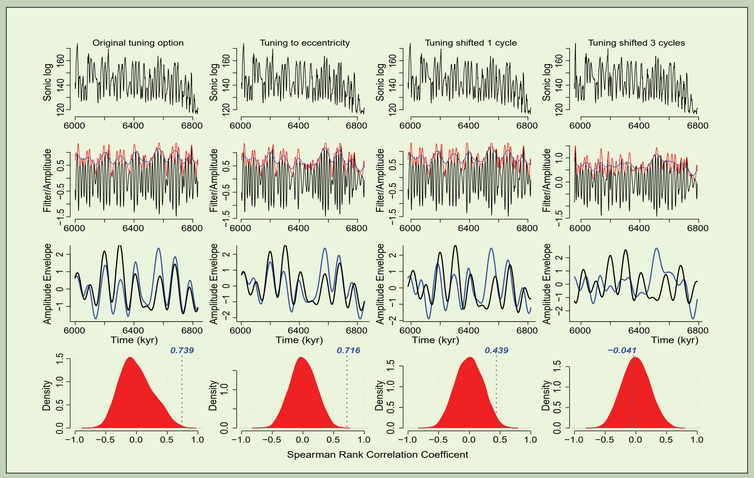


Figure 3



Conclusion

Our re-evaluation is consistent with the originally published astronomical FCs age of 28.201 ± 0.046 Ma and appears to argue for a discontinuation of alternatively published ages, although some issues remain to be solved.

TEST 2: U/Pb ages

Our U/Pb K/Pg boundary ages (Fig. 4) are younger than published ages[4], but in better agreement with the latest (younger) astronomical age for the boundary[5,6] (see also Fig. 5) and with Ar/Ar ages for both the boundary and Quaternary reversals[7], if our preferred FCs age is used. This age is also confirmed by new U/Pb zircon ages for the FCT itself (not shown).

Figure 4

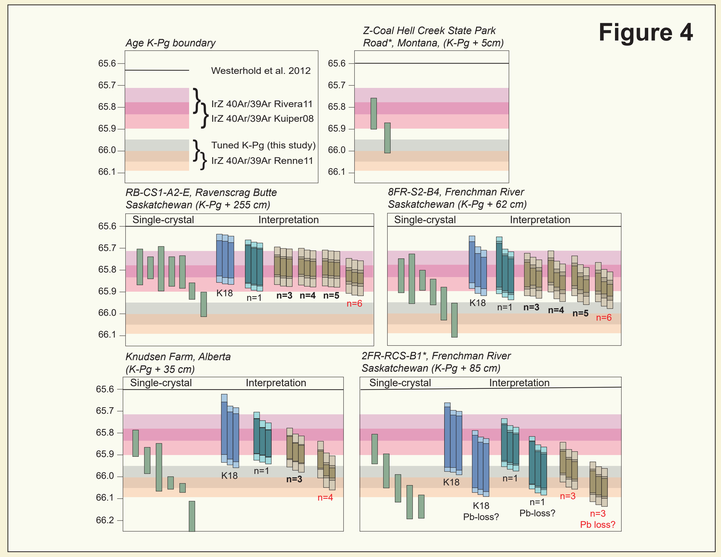
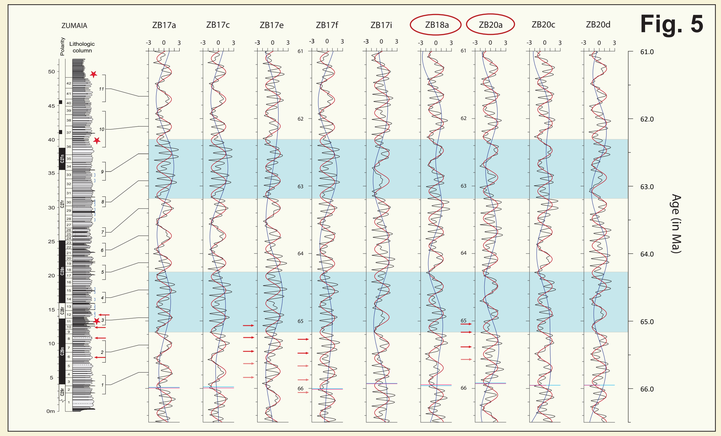


Fig. 5



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