



Testing obliquity-tuned timescales

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Astrochronology seeks to use rhythmic sedimentary alterations to provide high-resolution age models, and this method now provides a backbone for much of the Cenozoic and Mesozoic time scale. While a range of methods for orbital tuning are available, a common approach is to directly match observed sedimentary alternations to target curves from astronomical computations, followed by evaluation of amplitude modulations (AM) as a means of verification. A quantitative test for precession-eccentricity modulations in astronomically-tuned data has been recently developed, however, a similar test for obliquity is lacking. Here, we introduce an algorithm for obliquity AM assessment, which avoids effects of obliquity frequency modulation that can artificially mimic the expected AM. The approach can be used to test for correlation with the theoretical astronomical solution in a way similar to the precession AM method. Obliquity is an especially dominant component of orbitally-driven climate variability in the early Quaternary; here Quaternary models and climate proxy records are used to evaluate the reliability of the proposed method.