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Testing orbital forcing in the Eocene deltaic sequences of the South-Pyrenean Foreland Basins.

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Paleoclimate proxy records from marine pelagic sediments show that a link exists between long-period orbital cyclicity and the pattern of high latitude glaciations. Thus, a sound possibility exist that transgressive-regressive third-order sequences from shallow marine environments reflect long-period orbital (glacioeustatic) forcing, as suggested from a variety of shallow marine settings of different ages, from Mesozoic to Paleogene. In this study we aim at testing the role of the 400 kyr eccentricity cycle in the sequential organization of the Late Eocene deltaic sequences of the Belsue-Atares Formation, in the Jaca-Pamplona Basin. The overall record spans from latest Lutetian to early Priabonian and consists of nearly 1000 meters of siliciclastic deltaic to mixed platform sequences of various scales. Very notorious lateral changes in both stratigraphic thickness and sedimentary facies witness the synkinematic character of these sediments, deposited simultaneously to intrabasinal fold growth. A magnetostratigraphy based chronostratigraphic framework is used, first, to determine the age and duration of the sequences and, second, to establish a robust correlation with other deltaic sequences within the south-pyrenean foreland. The long-distance correlation exercise is used to discriminate between local (tectonic) and global (climatic) forcing factors, under the assumption that climate signature is synchronous, while tectonic forcing is prone to yield diachronic units at basin scale. Astronomical tuning with the 400-kyr cycle of the eccentricity solution of the Earth orbit is attempted on the basis of derived magnetostratigraphic age constrains. Our results suggest that transgressive (regressive) trends correlate with maxima (minima) of eccentricity cycle, a phase-relationship which is compatible with a base-level (accommodation) driven forcing.