
Astronomical calibration of the Early Jurassic Sinemurian Stage based on cyclostratigraphic studies of downhole logging data of the Prees-2 borehole (England; ICDP JET Project)

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Abstract

In late 2020, an approximately 650 m long core was drilled at Prees in Shropshire, England, as part of the ICDP project JET (Integrated Understanding of the Early Jurassic Earth System and Timescale). The main objective of this project is to obtain a complete and continuous sedimentary archive of the Early Jurassic. The Early Jurassic (~200-175 million years) was a period of extreme environmental changes, which will serve as an analogue for present and future environmental transitions. The project plans to provide a reference record for an integrated stratigraphy (bio-, cyclo-, chemo- and magnetostratigraphy) of this period. Analysis of geophysical borehole logs will allow the description of sedimentary cycles related to orbital parameters and paleoclimatic history if sedimentation environment and – rate permits. Here, downhole logging data from the Prees-2 borehole is used to construct an astronomical timescale for the Sinemurian stage, contributing to an integrated timescale for the Early Jurassic. Cyclostratigraphic methods including a statistical and visual approach lead to preliminary results of $\sim 6.5 \pm 0.3$ million years duration for the Sinemurian stage.

Keywords: Jurassic, timescale, Sinemurian, JET, cyclostratigraphy, downhole logging

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