
Impact of orbital forcing in the recurrence of the short-lived episodes during the OAE 1b

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Résumé

The Aptian-Albian transition is marked by the presence of four distinct clusters of black shale layers known as OAE-1b events, detailed from the oldest to the youngest, Jacob, Kilian, Paquier and Leenhardt, well recognized and studied in the Vocontian Basin, serving as important markers during this time period. In this study, we aim to examine the impact of Milankovitch parameters at the recurrence of these events. To achieve this, we conducted a high-resolution spectral analysis using magnetic susceptibility data obtained from 3500 bulk rock samples collected every 5 cm along Col de Pré-Guittard section (Albian GSSP, Vocontian Basin, SE France). The section consists of thick marl series, interrupted by thin limestone beds and organic-rich layers, deposited in the hemipelagic environment. To precisely locate these events, we measured organic-matter carbon isotope ratios and Total Organic Carbon. The spectral analyses reveal a strong influence of the 405-kyr and 100-kyr eccentricity cycles. Based on the number of 405-kyr eccentricity cycles, the duration of the interval encompassing the Jacob to Leenhardt levels is calculated at 4.03 myr and the duration between the events was estimated respectively at 1.55 myr, 1.62 myr, and 0.93 myr. Based on these periods, we conclude that the occurrence of these events cannot be attributed only to the Milankovitch cycles, involving additional factors such as the emplacement of flood basalts or oceanic basaltic plateaus contributing the development of larger-scale marine anoxia.

Mots-Clés: Orbital forcing, Vocontian Basin, Milankovitch parameters, OAE1b

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