Sedimentology and sequence stratigraphy of the lower Aalenian Opalinuston Formation from southern Germany

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Abstract

Aalenian sedimentary deposits in southern Germany have accumulated in a shallow-marine, epicontinental shelf environment. These accumulations are dominated by thick claystones and argillaceous siltstones, with increasing percentages of sandstones towards the top. Aalenian sediments are likely to represent a relatively complete stratigraphic record, however, the sedimentary evolution and paleoclimatic significance of these typically poorly exposed deposits remain largely unexplored. Here we present a suite of high-resolution x-ray fluorescence (XRF) core scanning data from southern Germany to identify Transgressive-Regressive cycles during the Aalenian stage. Results are based on three scientific drill cores of 200 – 250 m length that have been analyzed with an Avaatech XRF Core Scanner at a 10 mm sampling interval (10 keV, 500 μA). Resulting trends in elemental Si/Al ratios, which are indicative for subtle grain-size variations, combined with sedimentological observations on ichnofacies and bedform development were used to reconstruct shoreline trajectories and establish a sequence stratigraphic framework for the thick and largely homogenous lower Aalenian Opalinuston Formation.

Keywords: lower Aalenian, Opalinuston, Germany

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