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Semi-quantitative analysis of platform interior facies mosaic (Lower Jurassic, Jbel Bou Dahar, High Atlas, Morocco)

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The Sinemurian to Pliensbachian (Liassic) Jbel Bou Dahar (High Atlas, Morocco) is a well-exposed high-relief carbonate platform, measuring $\sim$7 by 35 km in size and has steep and high relief slopes. The platform developed in a rift basin, repetitively backstepped and finally drowned in the lowermost Toarcian. The excellent exposure provides a unique opportunity to extract 3D spatial information on lithofacies and stratal surfaces in various environments of deposition. This study focuses on one platform interior study window, about $\sim$1 km^2 and 20-30 m stratigraphic interval, located $\sim$200 m away from the platform margin. Lithofacies were analysed by standard field observations and petrography while boundaries and stratal surfaces were physically traced using DGPS.

Three lithofacies association were identified. Peloidal-skeletal packstone to grainstone intervals, dm to m thick, locally bioturbated and with scattered cm-dm thick intercalations of oncoid-rich grainstone containing *Cayeuxia*, sparse dasycladaceans, solenoporacean algae, lithiotid bivalves, gastropods and foraminifers indicative of a shallow subtidal lagoonal setting. Coarse-grained coated grain (cortoids, oncoids, pisoids) rud-

stone and grainstone show planar cross-bedding and a few cm-thick intercalations of peloidal packstone, stromatolites and columnar microbialites. Common grain types are algal fragments, bivalves and gastropods, intraclasts of platform interior wackestone and pisoidal packstones. They form tabular to lens-shaped bodies ranging in thickness from a few dm to 2m and are interpreted as shoal bars likely controlled by tidal currents that migrated in both directions but mostly toward the platform interior. Intervals (0.5-3 m thick) of thin bedded peloidal packstone with fenestrae, tepees, stromatolites and microcolumnar microbialites represent low energy inter- to supratidal settings. They interfinger with low angle cross bedded grainstones with peloids, sand-sized pisoids and superficial ooids and keystone vugs indicative of high energy intertidal beach or shoal environments. Evidence of vadose meteoric diagenesis is common in all the lithofacies association but pronounced in the peritidal facies. Abundant early marine cementation (as isopachous rims of fibrous cement and radiaxial fibrous), meniscus micrite and binding peloidal micrite filled the large range of primary porosity (up to 25%).

The overall depositional setting was a very shallow (1-2m) platform interior with non-depth dependent facies shifts, of auto- or allocyclic causes, that at certain location prevented the development of the simple shallowing-upwards peritidal cyclothems so typical in greenhouse intervals. The lagoonal subtidal facies exhibit the greater lateral continuity up to 1 km distance: it represents events of relative flooding of the platform top. The gravel-size coated grain bars are discontinuous, draped by microbialites during breaks in bar migration, interfinger with the lagoonal facies and grade upward into intertidal facies. Marine erosion at the base of the bars and subaerially exposure-related dissolution complicate the vertical and lateral facies relationships. The complexity of the facies mosaic might be the result of interplay of lateral shifts of depositional environments (bar migrations, tidal flat progradation), erosion due to currents and subaerial exposures, greenhouse low-amplitude sea level fluctuations and episodic subsidence in a rifting basin.