

## **Gradual vs. Episodic Sedimentation of Carbonate Reservoir Rocks, Western Sirt Basin, Libya**

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A clear distinction can be made between platform carbonates that originated from gradual day-to-day accumulation and those resulting from platform destruction by episodic currents and accumulation by storms. Both types of carbonates can be potential reservoirs in the Sirt Basin but their depositional history, external geometry and internal structural/textural make up is different. The first type, exemplified by Paleocene buildups (e.g., Satal Formation and its surface correlative Upper Tar and Had Members) is a stratified algal boundstone. Stratification is due to alternation of coarser and thicker, grain-supported laminae with finer matrix-rich laminae. The geometry of this type of stratification is most commonly planar or slightly inclined but wavy stratification that resembles algal stromatolites is also present. This type of carbonate is interpreted in terms of day-to-day accumulation of algal mats formed by aggradational and/or lateral accretion in the supratidal to near-shore subtidal environment; their external geometry is blanket-like. The second type, best developed in late to post Eocene age rocks, consists of skeletal grainstones. These sediments are interpreted as being deposited by storm-dominated processes that resulted in carbonate shoals, spillover lobes and large tidal channels. As well, there is evidence of earthquake induced soft sediment deformation (seismites). We suggest that the change in depositional types between Paleocene and late-to-post Eocene accumulations is the result of a late stage of rifting within the western part of the Sirt Basin.