SEDIMENTARY ARCHITECTURE, DEPOSITIONAL EVOLUTION, AND CONTROL FACTORS OF TURBIDITE CHANNEL COMPLEX 4 FROM THE TACHRIFT TURBIDITE SYSTEM (TORTONIAN, TAZA–GUERCIF BASIN, NE MOROCCO)

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ABSTRACT

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The sedimentary architecture of channelised turbidites can be highly complex as it reflects the response of submarine channels to several interplaying factors. Although largely studied through seismic imaging, turbidite channel fills are not definitely calibrated for sedimentary facies and small-scale architectures at a sub-seismic scale.

This contribution reports about the sedimentary architecture and the controls on the evolution of a ca. 20 m-thick channel-levee complex ('Complex 4') of the Tachrift System (Tortonian), which accumulated along the southern slope of the Neogene Taza-Guercif Basin (Rifian Corridor, NE Morocco). The studied channel-levee complex consists of, from base to top: (i) a ca. 7 m-thick mud-prone interval containing relatively small and vertically stacked channel fills with poorly developed muddy levees, (ii) a ca. 4 m-thick and >1 km-wide sandstone-rich middle interval made of lateral accretion packages (LAPs), which is progressively less amalgamated top ward and overlain by ca. 5 m of cm-thick sandstone intercalated with hemiplegic marlstones, and (iii) ca. 9 m-thick upper interval constituted by vertically stacked channel fills, made of variously directed LAPs, associated with well-developed levees.

This architecture suggests that, following a phase of inception (i), the channel underwent extensive meandering with very minor vertical aggradation, prior to be blanketed by 'retrogressive' muddy lobes (ii) during a phase of reduced sediment input. In turn, the uppermost interval (iii) records a late phase of channel re-establishment and aggradation. Bering this evidence in mind, changes of architectural style are interpreted as in response of variations in sediment supply and flow properties at a various range of temporal scales. These changes can modulate longer-term adjustment of submarine channels to profile of equilibrium, resulting in a large variety of architectures.