

## **Inhibition of Autogenic Dynamics in Alluvial Fans: Field Examples from the Tertiary of Spain and Implications for Process Recognition in Fan Successions**

Ventra, Dario <sup>1</sup> (1) Faculty of Geosciences, University of Utrecht, Utrecht, Netherlands.

Alluvial fans are depositional systems with a relatively simple organization, due to close physical coupling between a sediment source and an adjacent transfer/accumulation area.

Nonetheless, general models of fan evolution and stratigraphy are still inadequate, due to the very high sensitivity (and often case-specific responses) of such systems to allogenic controls.

Autogenic processes complicate this picture, being an intrinsic component of alluvial fan development. A distinction is here made between "lateral autogenic dynamics", tied to local topographic constraints on sediment distribution, and "vertical autogenic dynamics", related to base-level / sediment-transport feedbacks in the building-up and -out of clastic wedges.

The role of autogenic factors has been only recently highlighted by numerical and physical modelling, but remains unexplored in field-based studies, because of inherent difficulties in detecting ultimate causal relationships in the architecture of coarse-clastic successions at basin margins.

An example is presented here from the margin of the Tertiary Teruel Basin (central Spain), in which excellent outcrops consent to examine the stratigraphic architecture of a Miocene alluvial fan that evolved during a protracted phase of endorheic drainage and high sediment supply. This combination of factors promoted a regime of forced aggradation in the whole clastic dispersal system, coupled with particularly high sedimentation rates for a continental setting, as demonstrated by sedimentological and stratigraphic evidence in mudflat to ephemeral lacustrine deposits of distal settings.

Fan outcrops are characterized by a perfectly conformable architecture of stacked clastic sheets with variable character through time, due to interacting catchment, tectonic, and climatic controls, but with no evidence of internal unconformities, preserved feeder-channels or fan segmentation. This points to an essentially continuous regime of aggradation, with recognizable "lateral autogenic" processes, but complete inhibition of "vertical autogenic" dynamics.

Alluvial fans are important gateways for sediment distribution basinwards. Geological factors which dampen large-scale autogenic processes in fan construction, and related field-criteria for their recognition in ancient deposits, are discussed also in relation to examples from the Ebro Basin and in terms of their significance for the analysis of sediment dispersal in continental settings.