

## ***Interactive comment on “Autogenic versus allogenic controls on the evolution of a coupled fluvial megafan/mountainous catchment system: numerical modelling and comparison with the Lannemezan megafan system (Northern Pyrenees, France)” by Margaux Mouchéné et al.***

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We thank the reviewer for their encouraging comments, careful criticism of the text and insightful remarks that have helped us clarify and improve the manuscript. We give detailed responses to specific comments below.

The reviewer asked to "clarify how the simulation results were compared to the Pyrenean foreland and describe which measures were used to determine 'similarity' ". We

C1

compared the first order morphology of the landscape produced by the model to that of the Northern Pyrenean landscape: in both the foreland and the mountain we assessed the mean elevation, highest elevation, river spacing, relief (as valley-to-ridge elevation difference); in the foreland we also assessed the length, width and northward slope of the megafan. All these parameters agree between the modeled landscape and DEM of the northern central Pyrenees within 30 % for similarity to be accepted. This will be specified in the corrected version of the manuscript.

The reviewer asked for clarification on the use of the term "distributive" to describe the flow dynamics over the megafan. We should indeed precise that the flow on the fan is alternatively, both in space and time, (1) channelized with multiple, rapid avulsions occurring, and (2) unchannelized, overflowing the riverbed and diverging over the foreland. This pattern can be seen in Figure 3.

The reviewer pointed out that sections 5.1 and 5.2 are "rather descriptive". These sections describe the processes observed during the building and subsequent abandonment and incision of the megafan, Figures 3 and 4 are provided to support these descriptions. We do provide some quantitative data on the megafan evolution in sections 5.1 and 5.2 and figure captions (mean elevation change, aggradation rates, vertical amplitude of temporary and permanent entrenchment, river spacing, timeframe). However, we acknowledge the lack of quantitative data regarding water and sediment fluxes and the spatial distribution of erosion and deposition. We will provide these data in the corrected version of the manuscript (fluxes and maps of erosion/deposition).

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C2