We are grateful to **Reviewer 1** for giving us detailed comments to improve our manuscript. The responses to the comments from Reviewer 1 are addressed point by point as follows.

Comments

Shi et al. present combined analyses of grain-size distribution and magnetic susceptibility in modern fluvial sediments from the upper Min River, Eastern Tibet to distinguish regional tectonic vs climatic influences on fluvial deposition. Their study indicates that tectonic faulting exerts a first-order control on fluvial deposition in tectonically active regions, which are well supported by regional relief and hillslope angle data. As far as I know, this study proposes a new and plausible method to characterize the development of tectonic activity along a transect, which is distinctly different from the traditional low-temperature thermochronologic dating and seismic methods as we often see. Therefore, I recommend this manuscript for publication. In the meantime, there are some minor issues that are needed to be clarified before this manuscript can be completely accepted.

Thank you very much. Revisions have been made below according to your comments.

Comments

P33-34: The occurrence of well-sorted and well-rounded sediments may be related to a significant increase in rainfall and runoff at the source area with more erodible bedrocks, or to long-distance transport which may experience multiple sediment recycling.

Yes, we've also considered the possibility you mentioned. The segment IV is located in the downstream of the Dujiangyan, and large amounts of coarse debris (>250 μm) was captured in Zipingpu Reservoir. Well-sorted and well-rounded (pebbles) of fluvial sediments in segment IV may be related to long-distance transport which may experience multiple sediment recycling, further to say that it must be related to the long-time of scouring and sorting by rivers. We have corrected it in line 33-34.

P109-110: Which analyses of river sediments should be specified here.

Yes, we have specified that in line 111.

P118-119: …and tectonic activity is tectonically controlled by….

Thanks, we have corrected it in line 120.

P141: The location of Fig. 1a was not shown in the inset map.

Thanks, we have marked it in the inset map.

P200: the bedrock is naked well exposed.

Thanks, we have corrected it in line 203.

P286: what does the dotted line represent at the upper left part (from the top to about No 50) of the SUS data?

The dotted lines represent the average value of the whole sequence. We have specified that in the figure 3 caption (line 289).

P435: a higher of rivers incision rates???

We mean that active tectonics activity forced a higher regional denudation rate, rather than the river incision rates. We have corrected it in line 439.

P488: seem a little contradict with???

We mean that the hillslope angles and local relief gradually increase downstream along the Minjiang Fault are decoupled with the high and stable proportion of fine–grained background dust in the fluvial sediments of segment I. We have corrected it in line 492-494.

At last, I personally think the clarity of Figs 3-7 could be improved significantly. It is better to mark in color mode.

Thanks, we have modified Figs 3-7.