

Interactive comment on “Sediment transport processes across the Tibetan Plateau inferred from robust grain size end-members in lake sediments” by E. Dietze et al.

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This is a very instructive case study that illustrates the depositional differentiation in lacustrine environments as evidenced by the grain-size distributions of the individual facies. This differentiation is related to present-day climatic conditions (seasonal wind circulation, precipitation and wind shear velocity) and compared with typical depositional environments (aeolian, fluvial, alluvial fan). It includes special circumstances as impact of snow melt and deposition on top of a frozen lake. The paper estimates quantitatively relative proportions of each depositional component (fluvial, local aeolian, remote aeolian). Finally, also the limitations, potential pitfalls and future research

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challenges are discussed. The paper is well structured, describes the research objectives adequately, and is sufficiently illustrated. I have no scientific revisions to ask (only 2 minor questions), and make only some minor remarks that are rather technical. Therefore, I have no hesitation to recommend this paper for publication.

Minor remarks and suggestions: 1. The authors are well experienced in end-member analysis and sometimes it goes a bit (too) quick, I think, for readers who are less familiar with this method: -For instance, on p. 4861 l. 11-13, the definition of ‘quantile range’ should be explained in 1 or 2 sentences, rather than referring to a former publication of the authors. - In the caption of table 3: for the readability, please repeat the explanation of the main symbols (l, q, rEM).

2. Referencing is very careful and complete. Nevertheless: -the references to Dober-schütz et al. 2012, Fleming 2007, French 2007, Nedell et al. 1987, Rea 1994, Vandenberghe et al. 2004 are missing in the Reference List. -On the contrary, I did not found references to Long, Kasper et al 2013, Klován et al. in the text (maybe I overlooked them). -I suggest 2 additional references: one to complete your list of papers in which you report the successful application of end-member analysis (p. 4858 l. 27 to p.4859 l. 2 (Vriend et al. 2011 Contrasting dust supply patterns across the north-western Chinese Loess Plateau during the last glacial-interglacial cycle. *Quaternary International* 240,167-180), and one that describes the sedimentary facies differentiation in a lake environment based on detailed grain-size distributions (Torres et al. 2005 An environmental reconstruction of the sediment infill of the Bogota basin (Columbia) during the last 3 million years from abiotic and biotic proxies. *Palaeogeography, Palaeoclimatology, Palaeoecology* 226, 127-148). - p. 4869 l. 8: write Goossens instead of Gossens

3. Just two scientific points: - (p.4863 l. 13-19) Is it not possible that the secondary modes that often appear in different end-member distribution curves are deviations that are due to the calculation method of transferring laser diffraction patterns into grain-size distribution patterns (Fraunhofer), applied in the instrument? -Is it possible that your finest clay end-member (c. 1.7 μm) is a remote, very fine dust fall-out, next to

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your hypothesis of a fluvial reworked pedogenic weathered clay?

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