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Interactive comment on "Sedimentological characteristics of ice-wedge polygon terrain in Adventdalen (Svalbard). Environmental and climatic implications for the Late Holocene" *by* M. Oliva et al.

E. Serrano

enrique.lidia@ono.com

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- General comments

This is a interesting paper that makes an important contribution to the recent research on ice-wedges in arctic environment using sedimentological and pedological techniques and proxies to explain the environment where the ice wedge were developed during the Late Holocene. This paper has a good scientific basis and there are only a few points that can to be clarified. Some comments are made on the use of

loess and compare with very different environments, and the LIA loess genesis. But these are minor points though and overall this is an excellent paper that I think it is very suitable for Solid Earth and will be of interest to a wide audience of readers interested in late Holocene changes and ice wedge in arctic environments.

- Specific comments

Page 1199, line 24. The authors mention the "silty loess layers" without reference to the percentage of silt or other characteristic like provenance of material, and in the next unit speak only about "aeolian silts". It is interesting define if they can be defined as loess or not. The loess cover thick is mentioned in page 1205, line 3. Authors speak now about loess accumulation and loess deposition during LIA, not aeolian deposition. It is important clarify because below they compare this deposits with loess depositional system in central Europe (Hungary, Poland, Croatia), China and Siberia, and the geochemical properties. The timing (Pleistocene age) and environment (Ice Ages) are very different to the LIA conditions in the arctic. LIA Loess have been studied in Groenland (Example, Matthew G. Jackson, Niels Oskarsson, Reidar G. Trønnes, Jerry F. McManus, Delia W. Oppo, Karl Grönvold, Stanley R. Hart, and Julian P. Sachs. 2005. Holocene loess deposition in Iceland: Evidence for millennial-scale atmosphere-ocean coupling in the North Atlantic, Geology, 33, 509-512). So, in page 1277, line 23, the cited works do not seem to be similar regional setting, as it is said in the text.

Page 1204, line 6-8. As authors say, it seem the most convincing theory to explain the stratrigraphic differences, but in the next paragraph say that it is possible are related to climate changes by other regional proxies. The connection between a geomorphologic setting, very active and changing, and the general climatic evolution it is not easy, and the first hypothesis is more evidenced by authors than the second one. Climate changes, in the sense pointed, towards a less humid one, also implies more contrasted variations in the alluvial fan and the fluvial braided system.

Page 1206, line 25. It is true, but at local scale in the studied case the fluvial changes

occur in a braided system. Relations between local winds and fluvial changes are difficult to establish at local scale. As it is important for author's deductions it could be more hardly discussed. At this sense, changes and evolution of the braided and fan system over recent times could support information on this subject.

- Technical corrections.

Page 1193, line 27, erratum

Page 1197, line 14, erratum, "to a"

Page 1202, line 14, erratum, papar, is paper.

Lines 15 to 22: The information content in the paragraph is repeated from other one above and references cited. Could be better not repeat and to do a synthetic introduction to the discussion chapter.

Page 1207, line 9. Erratum, Â£higher?

Page 1207, Line 23. References must be ordered by date.

Page 1207, Line 20. Gallet et al. 2001, not cited in references.

Page 1211. line 8, erratum, the was. . .

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