

Interactive comment on “Extended range luminescence dating of quartz and alkali-feldspar from aeolian sediments in the eastern Mediterranean” by Galina Faershtein et al.

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The effort to elaborate a luminescence dating technique that allows determining accurate mid-Pleistocene ages is highly appreciated. The topic is indeed of prime interest to many of us and I have looked at this paper with great curiosity. I got a little lost between ages, depth and sediment units, but finally found out that the extended range stops at around 150 ka. My question is why standard quartz OSL is unable to determine an age of this range? The sediment description suggests that a pedogenetically altered dune sand has been dated. This dune sand should be composed of low activity quartz (alongside some plant and snail remains). The dose rate should therefore be <1

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Gy/ka and this is indeed so in the lowermost part of the section where K activity is low as expected. In semi-arid environments pedogenesis leads to uranium leaching down profile, typically alongside carbonate leaching (Langmuir 1978, *Geochim. Cosmochim. Acta* 42, 547). The latter is clearly evident from the Zilberman et al report (see Figs 5,6,7 therein), but it is less clear from the U/Th ratios listed in Table 1. Thus, uranium mobilisation was indeed negligible or, more likely, the disturbance terminated some U-234 half-lives ago, or, equally likely, some layers are enriched in Ra-226. I suspect that the dose rate was not constant during burial.

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