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Multi-Proxy provenance analysis of the Tarim basin, NW China

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The Tarim Basin in NW China hosts one of the largest active sand deserts, and has been considered as one possible source of the sediments that form the Chinese Loess Plateau.To gain a better understanding of the recent sediment system, this study analysed several provenance proxies (zircon U-Pb ages, heavy mineral content and composition) on sediment samples from recent fluvial deposits, alluvial fans, sand dunes across the basin. Here, we present zircon U-Pb data from 38 samples (over 4000 grain analyses) from the Tarim basin, together with their respective heavy mineral analyses, and also compare these to a large data set for the Chinese Loess Plateau and source areas, compiled from own analyses and literature (over 16000 grain analyses). Traditional approaches used to compare such large, multivariate data sets are prone to subjective interpretations. To avoid this, we applied MDS mapping, an established statistical method. Our results demonstrate; a) the power of this tool to quantitatively identify (dis-)similarities and trends within large data sets, b) a dominant southern Kunlun, Karakorum, Altun Shan source area compared to a minor influence from the Tian Shan in the north c) the sediment flux follows the general topographic gradient from south to north, driven by hydraulic transport during seasonal flooding, rather than the main wind directions from the north-east.