

## **Optical dating chronologies of dune reactivation in the south-eastern Arabian Peninsula**

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### **Abstract**

The Liwa Oasis of the United Arab Emirates contains some of the largest and most aerially extensive mega-barchanoid sand dunes on a global scale. They extend southwards into Saudi Arabia, forming the upwind margin of the Rub Al Khali sand sea. Locally the dunes reach up to 150 m in height, and are separated by interdune sabkhas (width up to 2-3 km). Past research in this area and the wider Rub Al Khali has highlighted evidence for precession-associated wet periods in the preserved record at 6-10 and 25-35 ka BP. These humid episodes have generally been indicated using radiocarbon dating techniques on lacustrine deposits, speleothems and palaeogroundwater surfaces. Evidence for dry periods in this area which would presumably be associated with dune mobilisation are not well known.

Here we present optical dating results on samples of aeolian sediment from long (c. >200m) drill cores extracted from the largest dune field of the Liwa area which provide a detailed sequence of both the wet and dry phase deposits. These are used to consolidate understanding of Late Quaternary environmental change in the region. Optical dating of the Liwa Oasis core sediments using the single aliquot regeneration (SAR) protocol (Murray and Wintle, 2000), amongst other techniques, has outlined a number of phases of rapid dune deposition. The most recent period of reactivation began at around 3 ka BP, after a hiatus in deposition since 5 ka BP. These preliminary results suggest that, during the the initial periods of dry phases of climate cycles, large bodies of sand are transported and deposited. Following the initial phase of rapid aeolian accumulation, the system appears to remain in stasis. Further dating of the sediment cores will be presented to establish a tighter chronological control on this, and other dry phases.