Seismically triggered mass movement events from the Dead Sea depocentre

E. Kagan and S. Marco

Department of Geophysics and Planetary Sciences, Tel Aviv University, Tel Aviv 69978, Israel

A paleoseismic record of the Dead Sea Transform from the Last-Glacial period is revealed in Lake Lisan (paleo-Dead Sea) sediments from the Dead Sea's depocenter. Core 5017-1-A was drilled during winter 2010/2011 and is the deepest of the cores from this ICDP campaign (water depth: 297 m, core depth from lake bed: 465 m). The sediments are mostly alternating aragonite and silty-clayey detritus (*aad*), laminated detritus (*ld*), gypsum layers and mass-movement sequences. The *aad*, *ld*, and gypsum are well known from the Lisan Fm. outcrops from the lake margin, while the mass-movement sediments are unique to the deeper environment.

Deformation features found in the core include: brittle deformations such as intraclast breccias, small faults, discontinuous laminae; ductile deformations such as folded and smeared laminae; mass-movement sedimentation such as turbidites and homogenites. The turbidites are ubiquitous and can be recognized by a coarse (sandy) base of a few millimeters to a few centimeters below a quasi-homogeneous layer of up to more than a meter. Huge (>1 m) folds and breccias are more common in the middle part of the section. An enormous quantity of sediment is added to this deep-lake section due to these events.

The Lisan period (70-14 ka) in this deep core is represented by about 115 m of sediment thickness, ~3 times thicker than the lake margin outcrops. The sedimentation rate of the Lisan period in the core and of the core in general is about 2m/1000 yr. The continuous deposition rate is probably similar to that at the margins, while numerous discrete mass wasting events are responsible for the much thicker section at the depocenter. Preliminary results suggest that there may be up to an order of magnitude more deformed layers in the core (Lisan Fm.) than during the same time period in the outcropping sections (lake margins). This is probably due to the fact that slumps, slides, brecciation, and turbulent flow from any part of the lake reach the depocenter, where this core was drilled. This may provide a paleoseismic record representing the entire Dead Sea Basin.