



Induced Seismicity at Lake Aswan Reservoir, Egypt

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The hypothesis of reservoir induced seismicity (RIS) is widely investigated over nearly 70 known cases in the world. In most cases, increased seismicity follows the impoundment, large lake-level changes. Until present, the classification of Lake Aswan seismicity is not well understood, whether it is RIS or tectonic activity case.

The largest magnitude event of Aswan seismicity is 5.7 took place on November 14, 1981 at ~ 20 km focal depth. It was the earliest seismicity from-, delayed 17 years after- the initial filling of the Lake Aswan reservoir in 1964 and was not associated to the maximum size of the reservoir filling. Moreover, this event occurred along the well-defined Kalabsha fault of approximately 300 km length trending in the east-west direction, perpendicular to the lake main course, and 60 km south of the Aswan High Dam.

Since 1982, the Aswan seismicity is regularly monitored by the Aswan local seismological network (ASN) and exhibits an extended sequence of the microearthquake activity. The ASN data suggest the separation between the shallow (granitic) seismicity from the deep sequence within the lower crust. New seismological and geophysical data are here analyzed. The correlation between shallow seismicity and water level fluctuations in the lake is well observed during the later observation period. The increased seismicity has occurred in a series of bursts with small magnitude events in cluster patterns. Focal regions of the clusters are governed by the nature of faulting below and near the reservoir. The shallow fractured zone is occupied by a low seismic velocity structure and its deformation is evident. The temporal and spatial characteristics of the shallow seismicity in Lake Aswan are more correlated to the reservoir induced event (RIS).

Key wards, Seismicity, Lake Aswan, RIS