Geophysical Research Abstracts,
Vol. 10, EGU2008-A-04213, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-04213
EGU General Assembly 2008

Source Moment Tensors of the earthquake Swarm in Abu-Dabbab area, Mars-Alam, South-East Egypt.

A. Hosny (1), M. Guidarelli (2), G.F. Panza (2,3)

1. Department of Seismology, National Research Institute of Astronomy and Geophysics, Helwan, Cairo, Egypt

(2) Department of Earth Sciences, University of Trieste, Trieste, Italy

(3) The Abdus Salam International Centre for Theoretical Physics, Trieste, Italy

Abstract

The seismic sources of the swarm of Abu Dabbab area, SE Egypt, which occurred in August 2004 are studied by investigating the moment tensors of 15 earthquakes. For each selected event, two sets of moment tensor inversions are carried out. One with fixed epicentral coordinates and the second one with variable epicentral coordinates. The data fit between observed and synthetic seismograms, computed using a multimode summation technique for an elastic layered media, is minimized by a least squares algorithm. The obtained fault plane solution for each event is in agreement with the few reliable first arrival polarities. The source time function (one or two peaks) which is obtained for each event indicates that even small events might be associated with complex sources.

The investigated focal mechanisms of all the events are deviatoric and represent different styles of faulting: normal and reverse with strike slip faulting mechanisms. The normal faulting events are characterized by focal depths larger than 7 km and the reverse ones are shallower with focal depths less than 6 km. The obtained compensated linear-vector dipole (CLVD) ratio is up to 35% for some events especially those with a shallow reverse faulting mechanism. The presence of events with shallow reverse faulting and high CLVD ratio, in addition to the initiation of a high level seismic ac-

tivity, in the study area, without a large seismic main shock, led us to suggest that this swarm could be due to a transient igneous intrusion, the high temperature being consistent with the heat flow at Abu-Dabbab.