Geophysical Research Abstracts, Vol. 9, 08841, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-08841

The 1997 and 2000 Swarms in West Bohemia (Central Europe): Comparison from Viewpoint of the Location, Space-time Energy Release and Source Mechanisms

J. Horálek, T. Fischer and Z. Hudová
Geophysical Institute, Academy of Science, Praha, Czech Republic

One of apparent geodynamic features of the western part of the Bohemian Massif is periodically reoccurring intraplate earthquake swarms, mostly of magnitude $M_L < 3.5$ at focal depths below 4 km. The Nový Kostel (NK) focal zone dominates the recent seismicity. The NK zone shows a distinct planar character; most of earthquake foci are located at depths between 6 and 11 km at a steeply dipping main fault plane (MFP).

Two recent larger swarms, which occurred there in January 1997 (nearly 600 $M_L \leq 3.0$ events) and in September to December 2000 (about 20 000 $M_L \leq 3.4$ events), were located about 1 km apart. Both swarms evinced strong time and space clustering, i.e. short inter-event times and narrow focal volumes. Nevertheless, the swarms manifest numerous significant dissimilarities that imply their different evolution. The 2000-swarm consisting of nine distinctly separated phases was wholly located at the MFP, whereas that of 1997 was of the two-phase character and took place in the two-arm cluster located across the MFP. Source mechanisms in the full moment tensor description also noticeably differ. Most of the of the 2000 swarm source mechanisms are cognate and show oblique normal faulting, however, events with oblique thrust faulting prevail in the very beginning of the swarm. All the 2000-events possess pure double–couple source. During the 1997-swarm two different source mechanisms occurred: oblique normal faulting with a pure double-couple source (during the 1^{st} swarm phase) and oblique thrust faulting with non-double-couple source (during the 2^{nd} swarm phase). Space and time distribution of the consecutive 2000-swarm events indicates a relevance of triggering effect of the prior earthquake upon subsequent events that makes for the self-organization of the swarm activity, while the space-time development of the 1997-swarm is indicative of presence of the high-pressured

crustal fluids, which could bring the fault close to its critical state and thus facilitated origination of the oblique thrust, non-DC events in the 2^{nd} phase of the swarm.