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The 2000-earthquake Swarm in the Western Part of the Bohemian Massif (Central Europe): Double Couple vs. Non-Double-couple Events

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Periodically reoccurring intraplate earthquake swarms, mostly of magnitude $M_L < 3.5$, are one of the geodynamic features of the western part of the Bohemian Massif. The last swarm, which occurred there between August and December 2000, consisted of about 20 000 $M_L \leq 3.4$ events. All the foci were located at a circular fault plane of a 3 km diameter at depths between 7.5 and 10.5 km, and showed a pronounced migration along the fault plane. The swarm was recorded by 5 to 16 well distributed local stations and located using the master-event method with accuracy better than 150m.

Source mechanisms in the full moment tensor description (MT) were retrieved for 95 events. We employed a single-source, absolute-moment tensor inversion, which inverts body-wave peak amplitudes using synthetic Green functions (GFs). To avoid difficulties with the S-wave amplitudes due to post-critical incidence we inverted only direct P- and SH-wave amplitudes. The fault plane was divided into segments of 400m x 400m. For each segment we calculated respective GFs and retrieved MTs of at least two events. The solutions prove that synthetic amplitudes fit those extracted from seismograms very well, particularly the P-wave amplitudes. Some MTs exhibit significant compensated linear-vector dipole, which is a consequence of complex fault processes. No significant volumetric components were found. Space and time distribution of the MTs signifies in fact a scenario of the swarm evolution. Furthermore, considerable P and S-wave amplitudes allowed us to test stability of the MT solution, particularly of non-double-couple components. The aim of this contribution is (1) to demonstrate faulting processes acting during the swarm, particularly a progressive propagation of the rupture, and (2) to point out causes that can yield fictitious non-double-couple

parts in MTs even though RMS of the real and synthetic amplitude differences, as a measure the of the successfulness of the MT solution, is sufficiently small.