CLYDE AND THE GOPHER: A PRELIMINARY ANALYSIS OF THE 12 MAY 1990 SAKHALIN ISLAND EVENT

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The 12 May 1990 Sakhalin Island earthquake (QED location 49.024°N, 141.937°E, Z = 611 km, M = 6.5) is the only deep-focus event in the NOAA/NEIC catalog within about 200 km of that preliminary location. Its precise location and its focal mechanism may provide important information about the subduction geometry and the tectonic processes beneath that area in the northwest Pacific. The objective of this presentation is not to discuss the tectonic implications of the event, but, rather, to present results from (and to document procedures used in) efforts to refine initial estimates of the focal mechanism.

By E-mail, the QED mechanism and the P-wave polarity data used to generate it were obtained from Presgrave and Needham at NEIC (E-mail address "NEIS::SEDAS"@isdres.er.usgs.gov), and a preliminary CMT solution from Zwart at Harvard (eq%geophysics@harvard.harvard.edu). The QED solution had trend and plunge estimates of 269° and 13° for the P axis, and 171° and 30° for the T axis. The preliminary CMT solution was significantly different with trend and plunge estimates of 5° and 49° for P, and 127° and 25° for T.

The event was well recorded, with sharp P and S arrivals, on CLYDE, the new GSE station at Blacksburg. Significantly, Blacksburg appears to be close to a *SV* nodal surface. Following instructions in the November, 1989, IRIS Newsletter (Plus help from Tim Ahem), waveform data were obtained from the IRIS DMC: first, long-period data from five stations using "Gopher" (CCM, COR, HRV, KIP, and PAS) and then, more recently, broadband data from those stations plus two others (KEV and TOL) using "Retrieve." The eight *SH* and the seven new *P* polarities from BLA and the IRIS-reporting stations were added to the NEIC/QED polarity list, and estimates of *SH/P* and *SV/P* amplitude ratios were included to constrain the solution. In the processing, the focal mechanism program, FOCMEC, was made more robust for testing solutions near nodal surfaces. The (current) preferred solution has trend and plunge estimates of 354° and 5*4*° for the P axis, and 13*2*° and 28° for the T axis — very similar to the preliminary CMT solution. This solution has about the same number of polarity errors as the NEIC/QED solution, but the only polarity errors for the eight stations are both P and SH at KIP, and it fits better the nodal surfaces based on the amplitude-ratio data.

Snoke, J.A. (1990), Clyde and the Gopher: a preliminary analysis of the 12 May 1990 Sakhalin Island event, Eastern Section of the SSA meeting (Blacksburg, VA, October), *Seism. Res. Letters*, **61**, 161.

CURRENT FAVORITE SOLUTION (JAS)

Dip,Strike,Rake   24.82   181.02 -144.58
Dip,Strike,Rake   75.92   58.18   -69.35   :Auxiliary Plane
Lower Hem. Trend, Plunge of A,N   328.18   14.08 91.02   65.18
Lower Hem. Trend & Plunge of B   232.94   20.00
Lower Hem. Trend, Plunge of P,T   353.59   54.47   131.77   28.02
MRR = -0.44 MTT = 0.01 MFF = 0.43 MRT = -0.75 MRF = -0.36 MTF = 0.35

PRELIMINARY HARVARD SOLUTION (CMT)

Dip,Strike,Rake   34.00   172.00 -155.00
Dip,Strike,Rake   76.33   60.86   -58.56   :Auxiliary Plane
Lower Hem. Trend, Plunge of A,N   330.86   13.67 82.00   56.00
Lower Hem. Trend & Plunge of B   232.64   30.45
Lower Hem. Trend, Plunge of P,T   4.98   48.88   126.90   24.78
MRR = -0.39 MTT = -0.13 MFF = 0.52 MRT = -0.72 MRF = -0.26 MTF = 0.43

QED SOLUTION (NEIC)

Dip,Strike,Rake   79.00   217.00 148.00
Dip,Strike,Rake   58.66   313.80   12.91   :Auxiliary Plane
Lower Hem. Trend, Plunge of A,N   223.80   31.34 127.00   11.00
Lower Hem. Trend & Plunge of B   20.02   56.35
Lower Hem. Trend, Plunge of P,T   268.93   13.47   170.92   30.18
MRR = 0.20 MTT = 0.73 MFF = -0.93 MRT = -0.42 MRF = -0.30 MTF = 0.13