

**CRUSTAL SEISMICITY AND SUBDUCTION MORPHOLOGY AROUND ANTOFOGASTA, CHILE : PRELIMINARY RESULTS FROM A MICROEARTHQUAKE SURVEY.**

COMTE, D. (1,3), PARDO, M. (1,3), DORBATH, L. (2), DORBATH, C. (2), HAESSLER, H. (2), RIVERA, L. (2), CISTERNAS, A. (2) and PONCE, L. (3).

(1) Departamento de Geología y Geofísica, Universidad de Chile, Casilla 2777, Santiago, Chile.

(2) Institut de Physique du Globe de Strasbourg, 5 rue Descartes, 67084 Strasbourg cedex, France.

(3) Instituto de Geofísica, Universidad Nacional Autónoma de México, México D.F., 04510 México.

During october 1988, 13 analog and 16 digital seismographs were installed in northern Chile between 22.5° S and 24.5° S and 68.5° and 70.5° W. The purposes were to monitor the microseismic activity probably associated to the Atacama fault system and to ascribe the morphology of the subduction zone near the southern edge of the great 1877 earthquake ( $M_w = 8.8$ ).

The analysis of the analog records provide a total of 553 events ( $2.0 < ML < 5.0$ ;  $rms \leq 0.5$ ). A set of 49 are shallow depth microearthquakes ( $\leq 30$  km) which might be associated to the Atacama fault system : 18 events have epicenters near the Coastal Scarp southward of Antofogasta. 6 events are distributed in the Mejillones Peninsula, and 17 events are located nearby the numerous branches of the Salar del Carmen fault northward of Antofogasta. Otherwise, to the southwest of Antofogasta, where not any fault branches are recognized, neither a shallow microearthquake was recorded. The actual distribution of the analog seismograph network did not provide enough resolution to determine focal mechanisms of such low magnitude earthquakes.

A cluster of shallow events located around 24° S approximately 500 km inland from the trench, is also observed in a region of active volcanoes.

About 450 events have depths varying from 31 km to 250 km; they permit to delineate the morphology of the subducting plate. North of 24° S the seismicity define a plate that dips 30° to the east up to 200 km in depth: south of 24° S and deeper than 70 km the seismicity suggests a change to a more subhorizontal subduction that reach 100 km. After that, an absence of seismicity is well defined, but around 500 km inland, intermediate depth cluster activity is observed: this activity is associated to the well known place of the 1950 ( $M_w = 8.2$ ) normal fault earthquake.