GPS OBSERVATIONS OF THE TECTONIC ACTIVITY IN THE TRIPLE JUNCTION AREA IN INDONESIA

ANDREA WALPERSDORF AND CHRISTOPHE VIGNY [1)]
LUHUT PARLUHUTAN, CECEP SUBARYA, AND SOBAR SUTISNA [2)]

The point of convergence of three major tectonic plates (the Eurasian, the Philippine and the Australian plate) is situated in Indonesia. The relative plate velocities are estimated by NUVEL1 to 7 to 8 cm/yr. The complex tectonic mechanism of the triple junction has been observed during a two years time span on the GEODYSSEA network, including some densification points, and on a local subnetwork.
A remeasurement of a local subnetwork confirms a high degree of deformation in the contact zone between the 3 plates. The deformation in this area is analysed in terms of rigid blocks rotation and deformation. The influence of 2 large earthquakes in the area (M_w = 7.8 01/01/96 and M_w = 7.0 22/07/96) on the motion of the Tomini station (North Sulawesi) is also discussed.
The block movement is also constrained by observations on the main fault system on its western limit, the Palu-Koro fault. Previous studies predict left lateral movements of up to 5 cm/yr (Silver et al., 1983). The GPS measurements on a transect across this fault show a present day left lateral displacement of 3 cm/yr.
The observations on the intermediate stations help constrain the localisation of the deformation and the locking depth of the main fault. Geomorphological observations show clear traces of active opening in the Palu fault zone. The GPS measurements will be able to confirm if the opening corresponds to the present day activity of the fault.

1) Laboratoire de Géologie,
École Normale Supérieure - CNRS,
Paris, FRANCE
2) BAKOSURTANAL
Cibinong
INDONESIA