

**ANDEAN DISPLACEMENT AND STRAIN PARTITIONING
OF THE NAZCA-SOUTH AMERICA SLIP VECTOR DURING THE LAST 5 MA.**

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From 75 mma^{-1} at 6°N to 87 mma^{-1} at 47°S of Nazca-South America plate convergence is presently absorbed in the Andes. Along any Andean traverse, the sum of relative velocities between points must equal the relative plate motion. We have developed a kinematic synthesis of displacement and strain partitioning in the Andes from 47°S to 5°N relevant for the last 5 ma. based upon:

- 1) relative plate motion deduced from oceanic circuits giving a roughly constant azimuth between 075° and 080° ,
- 2) moment tensor solutions for earthquakes since 1960,
- 3) structural studies of deformed Plio-Pleistocene rocks,
- 4) topographic/geomorphic studies,
- 5) paleomagnetic data,
- 6) geodetic data.

We recognize four neotectonic zones some with subzones and boundary transfer zones that solve compatibility problems between zones that are partitioned in different ways. These zones are not coincident with the "classic" zones defined by the presence or absence of a volcanic chain and the differences in finite displacements and strains and tectonic form and it is clear, therefore, that the long term segmentation and finite evolution of the Andes does not occur in constantly-defined segments in space and time.

In segment 1 (47° - 39° S), the slip vector is partitioned into roughly orthogonal Benioff Zone slip with large magnitude/large slip-surface earthquakes and both distributed dextral shear giving clockwise rotations of up to 50° and dextral slip on the curved Liquine-Ofqui Fault giving 5° - 10° of anticlockwise rotation.

In segment 2 (39° - 20°S), the slip vector is partitioned into Benioff Zone slip roughly parallel with the slip vector, Andean crustal shortening and a minor component of dextral slip, mainly on the Atacama Fault System. Between 39° and 34°S , a cross-strike dextral transfer zone that deflects the Chile Trench absorbs the shortening contrast between segments 1 and 2.

In segment 3 (20° - 6°S), the slip vector is partitioned into roughly orthogonal Benioff Zone slip, crustal shortening, sinistral trench-parallel faulting and north south extension. Compatibility between segments 2 and 3 is maintained by the sinistral ESE-trending Cochabamba shear zone and N-trending dextral faults.

In segment 4 (6°S to 5°N), the slip vector is partitioned into roughly orthogonal Benioff Zone slip and dextral strike-slip faulting in the fore-arc and volcanic chain.