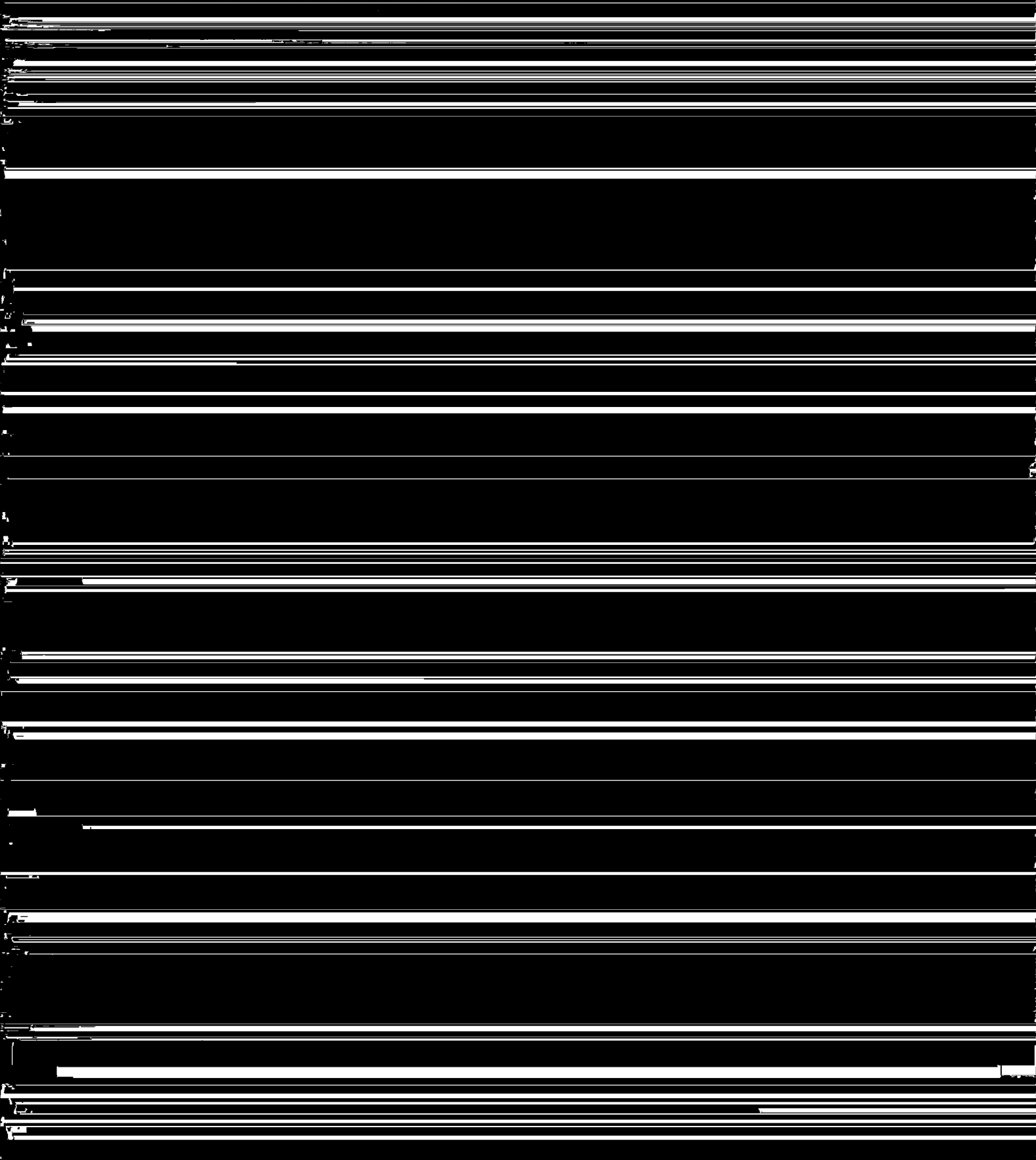


THE INTERDISCIPLINARY RESEARCH PROGRAM "DEFORMATION"



GOALS OF THE PROJECT

Geophysical, geodetic, geological und petrological studies will be carried along the Central Andean traverse aiming to tackle some of the key problems:

- the structure of the lithosphere and its rheological state and behaviour,
- the interaction between upper and lower plate,
- the distribution of the stress field and strain in time and space,
- the tectonic and petrological evolution of the upper plate under varying conditions of convergence,
- the geothermal field and heat transfer,
- the evolution of intramontaneous basins and isostasy,
- energy consumption during the orogenic processes.

A number of various field projects are under preparation for the first three-year period 1993 - 1995. The main activities will be focussed in the magmatic arc of the Western Cordillera because this zone is seen as key region for the problems of stress transfer from the upper- /lower plate system of the forearc into the strongly deformed back-arc region.

In order to investigate the seismic structure of the magmatic arc and its relations to the adjacent zones a network of seismic refraction profiles are designed in the Western Cordillera. Further 20 mobile seismological stations will be set up in this region under operation for about 3 - 4 month aiming to record and investigate shallow and intermediate earthquakes. The study of seismicity, the determination of focal mechanism and tomographic investigations should reveal the deeper structures and behaviour of a recent magmatic arc. Magnetotelluric deep sounding measurements will contribute additional information. Detailed gravimetric measurements will be carried out aiming to study the deeper structure of intramontaneous basins.

The measurements on the GPS-profile ANSA transversing the Central Andes and being under execution since 1989 will be continued. This study will be remarkably extended within an international co-operation with a profile running along the Pacific coast in N-S direction.

Special geological and petrological investigations are planned in the old and modern magmatic arcs aiming to reveal the complicated tectonic development of a magmatic arc system. Neotectonic studies are designed aiming to investigate the recent stress and strain field.

Such a project can be only realised by a close cooperation with geoscientific institutions in Argentina, Bolivia and Chile. In the past a successful cooperation has been developed which should be intensified and extended.

STRUCTURE OF THE COLLABORATIVE RESEARCH CENTER " DEFORMATION PROCESSES IN THE CENTRAL ANDES"

1. Deformation and stress field:

Neotectonic studies, recent kinematics by GPS measurements, modelling of the recent stress and strain field.

2. Rheological stratification at a convergent plate boundary:

Rock behaviour under high temperature and pressure condition derived from lab and field measurements, temperature field, heat transfer mechanism, rheology and fracturing of the Andean crust. Application of GIS.