CRUSTAL STRUCTURE AT THE ECUADOR ACTIVE MARGIN : EFFECTS OF THE CARNEGIE RIDGE AND ASSOCIATED SEAMONTS SUBDUCTION.

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Between 1°S and 2.5°S, the Ecuador active margin is underthrust by Carnegie Ridge, studded on its southern flank with numerous kilometers-wide seamounts, and draped with a 100-400m thick sedimentary blanket. We use multibeam bathymetric data (Pugu97 cuise) and 360-channels reflection seismic lines (MCS) (Sisteur00 cruise), to provide evidence for an enhance tectonic erosion of the margin, related to the sea-mounts subduction.

A ˜1500 m high subducted sea-mount, located 15 km landward of the trench, uplifts and deforms the margin : in the upper plate, while compressive structures are observed landward of the sea-mount, curved normal faults develop seaward and south of it, suggesting a 3D tectonic effect. Seaward of the subducted sea-mount, the continental slope forms a re-entrant bounded landward by a 2300 m-high scarp with a 15° slope, twice steeper than along the adjacent slopes. Between the trench and the toe of the scarp, a 10 km-wide flat area corresponds to 1-km thick crustal blocks detached from the slope and forming the subduction front. Along the trench, similar glided blocks are locally involved in small tectonic prisms at the subduction front. Another re-entrant on the continental slope seems to be related to the subduction of a second sea-mount, located 25 km landward of the trench. Between this sea-mount and the trench, a local thickening of the subduction channel up to 700 m is associated with low velocities material (˜2.5 km/s). The upper plate structure is rather different where it faces the bulk of the Carnegy Ridge, which is devoid of sea-mounts. There, the continental slope is regular, and the upper plate gradually thins toward the trench. The sea-mounts subduction thus seams to increase the tectonic erosion of the margin by breaking up the

upper plate into km-wide blocks, which are disintegrated at the front of the margin, and dragged in the subduction channel.

Both a sharp crustal thinning and subsidence of the continental margin are inferred from the data. On the basement, the relative constant thickness of the old sedimentary cover indicates that part of the crustal thinning has to be explained by basal erosion. A few kilometer landward of the trench, the base of the upper plate is characterized by a ˜1-km thick layered zone on the MCS lines. This layered zone shows velocities typical of the surrounding crust (4-4.3km/s), or slightly lower (3.6-4.0 km/s). This zone could correspond to altered crust above the interplates contact, and may reflect the ongoing basal erosion process.