

Structural styles in the Argentinean Andes at 34°S

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The variations in structural style of the Argentinean Andes in a transect at 34° S are described. At this latitude, the Argentinean Andes comprise two distinct regions: the Malargüe fold and thrust belt (MFTB) as part of the Cordillera Principal or Main Andes, and the Cordillera Frontal. The MFTB has a mainly thick-skinned structural style. At 34°S (its northern end) a transition zone to the thin-skinned Aconcagua fold and thrust belt (AFTB) is observed. The Cordillera Frontal is a basement uplift located to the east of the Aconcagua and Malargüe FTBs and its southern culmination is immediately south of 34°S.

Within the MFTB an inner and outer zone with contrasting structural styles are recognized at this latitude. The inner MFTB, located to the west, is a thick-skinned belt dominated by compressional tectonic inversion of originally extensional faults related to the Gondwana break-up during the Jurassic. The outer MFTB, located to the east, is a thin-skinned belt with several detachment levels within a late Jurassic and Cretaceous sedimentary succession. East of the outer MFTB the Cordillera Frontal is again thick-skinned, exposing the Paleozoic-early Triassic basement.

Activity periods of the thick- and thin-skinned sectors of the FTB have been constrained by dating of syn- and post-tectonic volcanics within the MFTB (Giambiagi *et al.*, 2005a) and by the relationship between structures and the age of syn-tectonic deposits in the foreland basin (Baldauf, 1997). Both areas show contemporaneous activity between 14 and 7 Ma. Field data from the inner MFTB support this, and favours the hypothesis for contemporaneous deformation in the inner and outer MFTB over the hypothesis of a thin-skinned phase followed by a thick-skinned phase (Kim *et al.*, 2005). Uplift of the southern end of the Cordillera Frontal is estimated in 9 Ma (Ramos, 2002).

Three stages of structural evolution are proposed. The first stage took place during the early to middle Miocene, and had a mixed structural style: thick-skinned in the inner MFTB and thin-skinned in the outer MFTB. The contrast in structural style would respond to the presence or absence of previous Mesozoic rift structures; in fact the limit between the inner and outer sectors of the MFTB coincides with the La Manga-Borballón lineament, proposed by Giambiagi *et al.* (2005b) as the master fault of the Atuel depocenter of the Jurassic rift. The second stage consisted in the late Miocene uplift of the Cordillera Frontal. The presence of this basement sticking point stopped the migration of the MFTB towards the east and triggered the third deformational stage: an out of sequence thin-skinned event which affected the whole MFTB.

References

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