Fold Belts, an Alternative to Thrust Belts: The Cape Fold Belt, South Africa

King, Rosalind[1], Graham Potts[2], Stephen Flint[2] (1) University of Adelaide, Adelaide, SA, Australia (2) University of Liverpool, Liverpool, United Kingdom

The Cape Fold Belt of South Africa approximates to a non-rotational arc with a near 90° bend. It consists of two branches exhibiting two styles of deformation. The north-south trending Cederberge Branch displays north-south trending, open and rounded folds, with kilometric scale wavelengths and amplitudes. The east-west trending Swartberg Branch exhibits east-west trending, open and rounded to angular folds with wavelengths and amplitudes of metres to kilometres. Large-scale east-west striking, top to north thrust faults are also observed in the Swartberg Branch. The two branches formed simultaneously in the Late Carboniferous to Early Permian during the early deposition of sediments in the adjacent Karoo Basin. However, the Karoo Basin sediments only exhibit structures consistent with the Swartberg style of deformation and not Cederberge.

The structure of the mountain fronts of the two branches controls the distribution of the two styles of deformation within the Karoo Basin. Deformation in the Cederberge Branch was confined below a frontal monocline on the western margin of the Karoo Basin. No Cederberge style structures are observed to the east of the monocline in the Karoo Basin. The Swartberg Branch formed with an unconfined upper surface, and deformation propagated northwards into the Karoo Basin unhindered. The two contrasting styles of deformation give alternative models for fold thrust belts. More importantly this work stresses that thorough structural investigations of a region are required to successfully predict and analysis structural styles in adjacent areas or a smaller part of the given region.