



Sinistral strike-slip dominated inclined transpression along the Pai-Khoi fold-and-thrust belt, Russian Arctic

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The Arctic Uralides comprise Pai-Khoi, Novaya Zemlya and the Taimyr Peninsula. Together they form a margin controlled salient in the former Baltica margin of Laurussia. This arcuate orogen forms a fundamental tectonic boundary between major hydrocarbon provinces; Timan-Pechora and Barents Sea to the southwest and west, respectively, and the South Kara Sea to the east. To understand the complex regional tectonic relationship between the Arctic Uralides and the South Kara Sea, it is essential to establish the structural and kinematic style of the various sectors of this remote orogen. This contribution focuses on the southern limb of the salient, the NW-SE trending, Pai-Khoi fold-and-thrust belt (PKFB), which links the Polar Urals with Novaya Zemlya approximately 600 km to the northwest.

The PKFB comprises a highly deformed, Late Cambrian to Mississippian age, passive margin succession, with allochthonous deep-water and continental slope facies rocks thrust over a shallow-water carbonate platform succession along the Main Pai-Khoi Thrust. Deformation is interpreted to have occurred between the Late Palaeozoic and end Triassic resulting in the formation of an apparent southwesterly verging fold-and-thrust belt with an associated foreland basin. Analysis of regional scale geological maps reveals the presence of large scale en-echelon folds, together with late stage, orogen-parallel faults, indicating that the evolution of PKFB has been influenced by a component of sinistral strike-slip. Detailed field data from a transect across the largest structure in the orogen, the Main Pai-Khoi Thrust, confirms the obliquity of both planar structures and finite stretching lineations to this major allochthon bounding thrust. Subtle but consistent variations in the orientation of finite stretching directions within zones of qualitatively differing finite strain were identified. Comparison of these variations with theoretical models of inclined transpression suggests that deformation within the PKFB is consistent with a model of strike-slip dominated, inclined transpression, where β (angle of far field displacement vector to transpression zone) is $\sim 20^\circ$, and the inclination of the deformation zone (δ) is shallowly to moderately inclined ($20\text{-}50^\circ$).

Sinistral strike-slip dominated transpression along the Pai-Khoi sector the Arctic Uralides is consistent with a Carpathian/Pannonian analogue model for the evolution of the South Kara Sea and its peripheral orogen.