



New Palaeomagnetic Results From the Cambrian Slaklidalen Formation of the Hornsund Region, Southern Spitsbergen

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The Lower Cambrian Slaklidalen Formation from the Sofiekammen Mt. Chain (southern Spitsbergen) has been palaeomagnetically investigated. The rocks under study belong to the Central Svalbard Terrane (division after Harland and Wright 1979, Harland 1997). The coercivity spectra measurements and analysis of IRS thermal demagnetization curves prove that magnetite is the main magnetic carrier. 72 cores drilled from 24 independently oriented rock samples collected from 4 localities of the opposite limbs of the Sofiekammen Syncline has been demagnetized using thermal and alternating field methods. In 80% of specimens we were able to isolate soft NRM component labeled A (with T_b spectra below 300°C) and moderate-to-high temperature component labeled B (with T_b spectra ranging from 300° to 575°, usually to 450°C). Component B shows the best grouping before unfolding Slaklidalen beds to paleohorizontal, indicating postfolding origin of this component. The overall mean direction calculated for B components from 4 localities is $D=18,3^\circ$ $I=11,2^\circ$ $k=19,19$ $\alpha_{95\%}=4,2^\circ$. Corresponding palaeopole (PLAT=18°N, PLONG=175°E) falls into the Silurian sector of APWP for Baltica, suggesting that Svalbard remained in the present day orientation with respect to Baltica since the Silurian times. Since there is no evidence for coincidental similarity between the paleopole B and Silurian poles for Baltica, we attribute an origin of the component B to Caledonian metamorphism and consequent remagnetization of the rocks at the turn of the Late Silurian and the Early Devonian. Our results support the hypothesis put forward by Birkenmajer (1978, 1990) that the Sofiekammen Syncline is the Caledonian structure that has not been refolded during Alpine tectonic events.

The palaeomagnetic investigations of the Lower Paleozoic succession of the Hornsund region, Central Svalbard Terrane is the part of the broader project which aim is to test the hypothesis of Harland and Wright (1979) about the pre-Devonian separation of crustal blocks which now constitute Svalbard Archipelago.

References:

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