



Potential field data in understanding the construction of the Pangea supercontinent: outcomes and challenges on the Central Asian Orogenic Belt

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The Central Asian Orogenic Belt (CAOB) is a Paleozoic accretionary-collisional orogen located at the eastern Pangea in between the Siberian Craton to the north and the North China and Tarim Cratons to the south. Several contradictory geodynamic models were proposed to explain the tectonic assemblage: oroclinal bending and strike slip duplication of giant intraoceanic arc or progressive lateral accretion of linear continental and oceanic terranes towards the Siberian Craton. However, none is generally accepted. A multidisciplinary approach integrating potential field analysis with geological and geochemical interpretations provides new insights into the understanding of the crustal structure beneath the CAOB. The geophysical characterization of the orogen allow us to: (1) correlate the contrasting tectonic domains with the thickness of the crust thereby revealing the inheritance of Paleozoic and Mesozoic orogenic history, (2) unravel the existence and distribution of suspect terranes in accretionary systems, and (3) determine the significance and possible origin of the major anomalies which are related to tectonic processes such as lower crustal relamination, presence of deep seated fault zones or main tectonomagmatic zones. With such examples, we demonstrate the real benefit and the significant progress which can be achieved by using gravity and magnetic anomalies in the construction of the Pangea supercontinent.