How did it look before it starts? the Mesozoic tectonic evolution of Tian Shan.

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The late Oligocene to Present growth of the Tian Shan range resulted from crustal shortening related to the ongoing India-Asia collision. However, the large-scale structure of the Tian Shan lithosphere was set by complex accretions of island arcs and amalgamation of continental blocks during the Palaeozoic. This initial structure, and especially the major tectonic boundaries separating the various terranes played a first order role in the subsequent evolution of the range. The Palaeozoic and Cenozoic evolutions of the range have been and are still widely studied and discussed. However, while the Mesozoic evolution has a major importance for the subsequent history and hydrocarbon resources in the area, little is known on this period that separates the two main orogenic events.

Low temperature thermochronology data and geomorphology studies have shown that a large-scale peneplanation surface developed in Central Asia from Early Jurassic to Late Cretaceous. In Tian Shan, this surface is still partially preserved as plateaus or gently dipping – poorly incised surfaces. However, using U/Pb dating on detrital zircons from the northern piedmont of the range, we recently showed that the Jurassic and Cretaceous sediments underwent nearly constant erosion and recycling indicating vertical tectonic movements.

Here we make a synthesis of the available data in order to draw a general picture of the Mesozoic Tian Shan. This synthesis is completed by results from ongoing sediment studies within the piedmont and inside the range associated to geochemistry on newly discovered Mesozoic volcanism. Those results document Mesozoic extension within the range. Extensional deformation explains both the formation of localised, small-scale topography inducing sediment recycling and the preservation of the planation surface on the topmost surface of the horsts. The resulting model will be used to set the tectonic, sedimentary and topographic pattern of the range prior to the Tertiary deformation.