Tectonic Evolution of the North-western Tibetan margin and the Pamirs as determined from the sedimentary record of Aertashi, Western Tarim Basin, China

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The India-Asia collision is the archetypal example of continent-continent collision, however little is known of how deformation has propagated internally through the northern margin of Tibet and the Pamirs. This project focuses on an area of the western Tarim basin (Aertashi (Fig 1)) where a Cenozoic sedimentary record of erosion from the northern Tibetan margin / Pamir salient can be obtained (Fig 2), providing new evidence to explore the impacts of India-Asia collision on the Asian interior, in particular the timing and evolution of the Pamir Salient and Western Kunlun mountain range.

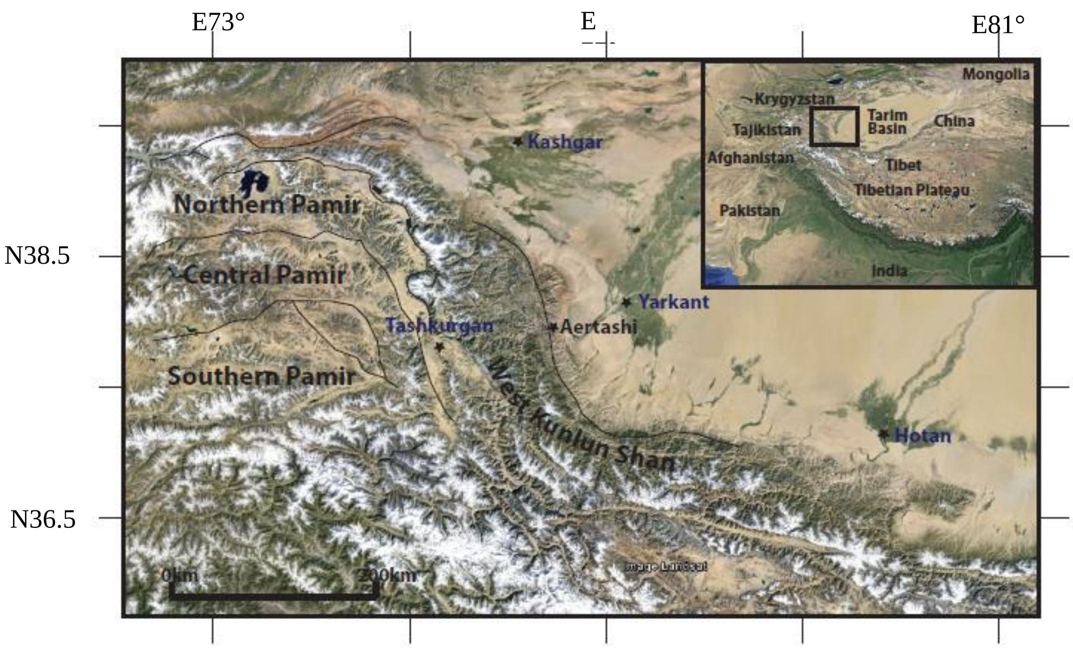

Figure 1. Location map for Aertashi, Western China.

The project has 3 key elements:

1. Characterisation of modern rivers draining the North, Central and South Pamirs and West Kunlun using U/Pb-fission track double dating on detrital zircons, Sr-Nd on muds, and petrography and heavy minerals on sands, in order to a) elucidate the regions' geological history and b) be able to identify detritus from these potential sources in the Aertashi section.
2. Use the same techniques as described above, to examine sediments throughout the Aertashi section, western Tarim basin, focussing on the Eocene – Pleistocene section in order to identify Pamir / Western Kunlun sources in the section .
3. Carry out a magnetostratigraphic study of the Aertashi section in order to a) place provenance changes identified in a temporal time frame and b) document the palaeo-rotations of the section and the subsidence history of the basin, to be interpreted in the context of adjacent hinterland tectonics. This work is a continuation of previous work conducted by Bosboom et al (2014).

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Preliminary results will be presented.

Age (Ma)	Epoch	Group	FORMATION	THICKNESS	LITHOLOGY	ENVIRONMENT
0	Q		Xiyu	200-2000 m	grey conglomerates with overlying volcanics	Alluvial fan and volcanics
5	Plio		Artushi	200-3400 m	reddish - grey conglomerates and sandstones	Distal to mid-alluvial fan
10–15	Miocene (Late, M)	Wuqia Group	Pakabulake	350-2200 m	brownish - red to grayish - white mudstones and siltstones	fluvial and lacustrine facies
20	Miocene (Early)	Wuqia Group	Anjuan	70-1000 m	brownish - red mudstones interbedded with greyish - green mudstones, siltstones and sandstones	distal fluvial, braided fluvial and overbank flood plain
25–30	Oligocene (Late, Early)	Wuqia Group	Kezilouyi	200-500 m	red-beds including mudstones, siltstones, sandstones and gypsum interbeds	Fluvial channel fills and delta plain deposits
35	Eocene (Late)	Wuqia Group	Bashibulake	300-500 m	reddish muddy siltstone,with some shell and gypsum beds	final marine regression cycle with fluvial channels at top of sequence
40	Eocene (Middle)	Kashi Group	Wulagen	10-200 m	grey - green mudstones intercalated with shell beds, shelly limestones and muddy siltstones (occasionally overlain by massive gypsum beds)	Shallow marine transgression - regression cycle
45	Eocene (Middle)	Kashi Group	Kalatar	20-180 m	grey massive limestones, marls and grey - green mudstones with interbeds of shelly limestones, oolitic limestones, shell beds and gypsum	Shallow marine and lagoonal facies
50–55	Eocene (Early)	Kashi Group	Upper Qimugen	10-150 m	brown - red (gypsiferous) mudstones intercalated with grey - green mudstones (occasionally overlain by brown gypsiferous mudstones and massive gypsum beds)	Marine regression
60	Paleocene (L, M)	Kashi Group	Lower Qimugen		grey green mudstones, siltstones and fine-grained sandstones intercalated with shely limestones	Shallow marine transgression
65	Paleocene (E)	Kashi Group	Aertashi	20-300 m	massive gypsum beds intercalated with gypsiferous mudstones and dolomitic limestones	Shallow Marine and lagoon facies

Figure 2. Lithostratigraphy of sediments in the Western Tarim Basin modified from Bosboom et al (2013), Wei et al (2013) and Zheng et al (2010)

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