

## **Tracing an intraoceanic Paleozoic subduction zone in western Junggar of China by geophysical imaging**

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Western Junggar is located in the southwest of the Central Asian Orogenic belt (CAOB). Its formation and evolution during the Paleozoic is still under hot debate.

In this study, we use magnetotelluric (MT) profiling and seismic array data to image the deep structure of western Junggar. The geometries of electrical conductivity and shear velocity clearly reveal a failed intraoceanic subduction system which is believed to develop during the late Paleozoic and very similar to a modern one. The variations of the Moho depth imaged by Ps phases is closely related to the variations of temperature. Some bowl-shaped intrusions characterized by MT data show their emplacement in an extension setting, limiting the failure of subduction to be around 320 Ma. The minimum resistivity directions in the crust and in the lithospheric mantle display a ~70 degrees difference, which could be ascribed to an oblique subduction. Combining geological and geochemical data, we synthesize an evolution model for the western Junggar during the Paleozoic time.

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### Reference

- Xu, Y., et al., 2016. *J. Geophys. Res. Solid Earth* 121, 83–98.  
Yang, B. et al., 2016. *J. App. Geophys.* 135, 288-296.  
Liu, Y., et al., 2016. *Geophys. J. Inter.*, in revision.  
Zhang, S., et al., 2016. *Tectonophysics*, in revision.  
Wu, S., et al., 2017. in preparation.