Supporting Information for

**Anatomy of two Permian greenschist- to blueschist-facies tectonic mélanges in central Solonker Suture Zone (Inner Mongolia, China): Evidences for divergent double subduction and soft collision**

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**Introduction**

This supporting Information file contains extended descriptions of analytical methods and the captions of Tables S1-S4. Tables S1-S4 are available at <https://github.com/liuhuichuan1986/liuhuichuan.git>.

**Text S1 Analytical methods**

Zircon grains were extracted using conventional heavy liquid and magnetic techniques, and were mounted in epoxy, then polished and coated with gold for cathodoluminescence (CL) imaging at Guangdong Provincial Key Laboratory of Mineral Resources and Geological Processes, Sun Yat-Sen University, Guangzhou, China.

Zircon U-Pb dating and trace element analyses were conducted using a laser ablation–inductively coupled plasma–mass spectrometry (LA-ICP-MS) at Tianjin Geological Survey Center (China). The zircon standards 91500 and GJ were used to calibrate the U-Th-Pb ratios. The spot size for data collection was 30 µm. The errors for individual U-Pb analyses are presented with 1σ error and uncertainties in grouped ages are quoted at 95 % level (1σ). Off-line inspection and integration of background and analysis signals, and time-drift correction and quantitative calibration for trace element analyses and U–Pb dating were performed using ICPMSDataCal (Liu *et al.*, 2008). Further detailed descriptions of the instrumentation and analytical procedure for the LA-ICP-MS zircon U-Pb and trace element technique are similar to those described by Yuan *et al.* (2004). In situ Hf isotopic analysis was conducted using a LA-MCICPMS at Tianjin Geological Survey Center (China). Lu–Hf isotopic measurements were performed subsequently on the same spots or the same age domains of zircon grains with concordant U-Pb age (discordance b5%). For more details, please refer to the reference Xia et al., 2016.

Whole rock samples for geochemistry were crushed to 200-mesh using an agate mill for elemental analyses. The major oxides were analyzed by a wavelength X-ray fluorescence spectrometry at Tianjin Geological Survey Center (China). Trace element analyses were performed at the Tianjin Geological Survey Center by a X Series II ICP-MS. Detailed sample preparation and analytical procedure followed Li *et al.* (2002).

**References**

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**Table captions**

**Table S1** Major rock units of the Zhurihe tectonic mélange

**Table S2** Zircon U–Pb analytical results

**Table S3** Major oxides and trace elemental analytical results

**Table S4** Zircon in-situ Lu-Hf analytical results

Tables S1-S4 are available at <https://github.com/liuhuichuan1986/liuhuichuan.git>.