New Paleomagnetic Insights Into the Neoproterozoic Connection Between South China and India and Their Position in Rodinia

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Abstract  A paleogeographic affinity of the south China craton (SCC) with India in the Neoproterozoic has long been advocated based on lines of geological evidence. However, the lack of coeval paleomagnetic data renders the putative connection ambiguous. Here we report new paleomagnetic results obtained from seven ca. 770 Ma mafic sills in SCC that provide new critical constraints on the issue. The data quality is assured by a positive regional tilt test, a reversal test, and by adequately averaging-out paleosecular variation. Our data, together with coeval poles from the global paleomagnetic database, support a reconstruction in which the SCC was connected with India at ca. 770 Ma via linkages with smaller continental blocks. The SCC-India landmass was located at high-to-mid latitudes and far away from the core of Rodinia at ca. 770 Ma.

1. Introduction

The Neoproterozoic connection between the south China craton (SCC) and India has long been advocated for the similarities of their geological records (e.g., Cawood et al., 2013; Jiang et al., 2003; Meredith et al., 2017; Zhang et al., 2013, 2015; Zhou et al., 2006). The Tonian to Ediacaran stratigraphic architectures in the Yangtze block of SCC and the Lesser Himalaya region of India are broadly comparable (Jiang et al., 2003). Similar age distributions and Hf-O isotopes features of detrital zircons from the Tonian strata between the Yangtze block and northwestern India demonstrate that they shared a common provenance (Wang et al., 2021). The Cathaysia block also shows a consistent detrital zircon spectrum of the Tonian and Ediacaran sequences with the Greater Himalaya region (Qi et al., 2020; Yu et al., 2008). Coeval igneous rocks in the western to northwestern SCC, northwestern India, Seychelles, and Madagascar are considered to have formed in a similar arc-related setting (Ashwal et al., 2002, 2013; Dong et al., 2012; Zhou et al., 2006). Zhao et al. (2018), further correlated the Neoproterozoic igneous rocks and sedimentary sequences from the Jiangnan Fold Belt in the SCC with those in the Delhi Fold Belt of northwestern India and suggested the two belts could be linked. Furthermore, the low-δ18O signature of the zircons from ca. 780-750 Ma mafic sills in SCC that provide new critical constraints on the issue. The data quality is assured by a positive regional tilt test, a reversal test, and by adequately averaging-out paleosecular variation. Our data, together with coeval poles from the global paleomagnetic database, support a reconstruction in which the SCC was connected with India at ca. 770 Ma via linkages with smaller continental blocks. The SCC-India landmass was located at high-to-mid latitudes and far from the core of Rodinia at ca. 770 Ma.

The loose paleomagnetic constraint fitting the upper Liantuo Formation pole of SCC with the Malani Igneous Suite (MIS) pole of India permits the reconstruction of a tectonic connection between the SCC and India (Evans, 2009; Zhang et al., 2013). However, the age of the Liantuo Formation remains highly controversial (e.g.,
Lan et al., 2015; Ma et al., 1984; Park et al., 2021), actually rendering any specific connection between the SCC and India in the late Neoproterozoic ambiguous.

Here we report newly obtained paleomagnetic results from the ca. 770 Ma mafic sills intruding the Neoproterozoic Banxi Group and its equivalents in the Hunan Province, SCC. The pole provides a positive test for the connection between SCC and India and suggests a reconstruction for the SCC-India tectonic entity relative to the other major continents of the core of Rodinia around 770 Ma.

2. Geological Setting and Sampling

Numerous ca. 770 Ma mafic dykes and sills in the SCC have been reported over the last two decades (Ge et al., 2001; Kou et al., 2018; Liu et al., 2020, 2021; Wang et al., 2008, 2009; Zhou et al., 2007). They are widely distributed in the Yangtze block, intruding the Banxi Group and its equivalents (Figure 1; HNBGMR, 1988). Most of the dykes exhibit ocean island basalt (OIB)-like pyroxenite, gabbro, and diabase (Kou et al., 2018; Liu et al., 2020, 2021; Wang et al., 2019; Zhou et al., 2007). Our paleomagnetic sampling was performed in the Guzhang and Anjiang areas, Hunan Province. The two locations are ~150 km apart (Figure 1a). In the Guzhang area, the 3–12-m-thick sampled sills occur with gentle dips (Figures S1a–S1e in Supporting Information S1). They intruded the Wuqiangxi Formation, the upper part of the Banxi Group, which is dated at ca. 809 Ma (Zhang et al., 2008). One of the Guzhang dolerite dykes was dated at 768 ± 28 Ma through the use of U-Pb SHRIMP (sensitive high-resolution ion microprobe) method on zircon (Zhou et al., 2007). In the Anjiang area, the mafic rocks intruded the Zhuangxiangwan Formation, Gaojian Group (the equivalents of the Banxi Group; Zheng et al., 2001). Numerous zircon U-Pb ages from 774 to 791 Ma, mostly through the use of LA-ICP-MS (laser ablation inductively coupled plasma mass spectrometry) method, have been published for these mafic intrusions (Kou et al., 2018; Liu et al., 2020; Wang et al., 2019). One of the two sampled sills (AJS01) was dated at 773.6 ± 4.1 and 779.1 ± 4.3 Ma, and the other (AJS02) was dated at 791 ± 6 Ma (Figures 1c; Kou et al., 2018; Liu et al., 2020). They are 20–100 m in thickness and occur in an anticlinorium with steep dips (Figure 1c and Figure S1f in Supporting Information S1). The anticlinorium has the Banxi Group at its core and its Sinian-Cambrian limb is uncomfortably overlain by Devonian strata (Figure 1c; HNBGMR, 1988), suggesting an Ordovician-Silurian age of the regional folding in the SCC.

A total of 176 paleomagnetic samples from 15 sites from seven sills were drilled in the two areas. We also collected 55 samples from the host rocks of Guzhang sills for the baked-contact test. A portable drill was used in sampling. The orientation of core samples was conducted by using a magnetic compass and a solar compass when possible. The differences between these two orientation methods are less than 3° (most <2°), suggesting no significant magnetic anomalies in the region.

3. Methods and Results

All drill cores were cut into 1–2 specimens of 1–2.2 cm in length. Thermal susceptibility was measured using a KLY-4S Kappabridge with heating from −192 to 700°C and cooling back to room temperature. Representative samples were selected for isothermal remanent magnetization (IRM), backfield demagnetization of saturation IRM (SIRM), and thermal demagnetization of the three-axis IRM experiments (Lowrie, 1990) to determine the magnetic carriers. Progressive alternating field (AF) demagnetizations up to a field of 140 mT were applied on several representative samples of the Guzhang sills. Most of the samples were subjected to stepwise thermal demagnetization performed on ASC-TD-48 and MMTSC furnaces. Remanent magnetizations were measured using a 2G-755-4K cryogenic magnetometer and a JR-6A spinner magnetometer. Demagnetization steps of the samples from the sills and baked rocks ranged from 50 to 80°C in the low temperatures, subsequently 5–20°C until 595°C. Meanwhile, the unbaked samples from red beds were demagnetized with temperature intervals of 5–10°C until 690°C. Demagnetization and remanence measurement were both completed in a magnetically shielded room in which the residual field is <300 nT. All the aforementioned experiments were conducted in the Paleomagnetism and Environmental Magnetism Laboratory (PMEML) at the China University of Geosciences, Beijing (CUGB). Based on these measurements, several samples were selected for magnetic hysteresis loop analyses using a MicroMag 3900 Vibrating Sample Magnetometer at the Institute of Geophysics, the China Earthquake Administration. Paleomagnetic data analysis was conducted using the software developed by
Figure 1. (a) Tectonic framework of the south China craton displaying the paleomagnetic sampling areas (modified from Zhang et al. (2021)). The inset shows the location of the SCC in China. (b, c) Simplified geological maps of the Guzhang and Anjiang areas, respectively. The paleomagnetic sampling sites are marked with red stars. The ages of the sills and dykes are from the references (1) Zhou et al. (2007), (2) Kou et al. (2018), (3) Liu et al. (2020).
Principal component analysis was used to separate the paleomagnetic components (Kirschvink, 1980) and Fisher statistics were used to calculate mean directions (Fisher, 1953).

The natural remanent magnetization (NRM) intensities of the Guzhang sills vary from 1.57 to 338 mA/m except for sill GZS05 with slightly larger intensities of 0.12–1.75 A/m. The Anjiang sills have weaker NRM intensities of 0.14–4.33 mA/m. Thermal and AF demagnetization results show that most samples preserve two components (Figures 2a–2c and Figure S2 in Supporting Information S1). There are two kinds of soft components identified from the samples of the Guzhang sills. The soft component “A” isolated below 350°C or 15 mT has random directions with a slight majority around the present-local field in situ (Figure S3a in Supporting Information S1), and it may mainly be of a recent viscous remnant magnetization (VRM) and mix with some origin-unknown magnetizations. The soft component “B” has unblocking temperatures between 450 and 500°C and in situ mean-direction of $D = 18.0^\circ, I = 45.1^\circ \times (k = 13.9, \alpha_{95} = 5.3^\circ$, Figure S3b in Supporting Information S1), corresponding to a paleomagnetic pole at 74.0°N, 202.2°E (dp = 4.2, dm = 6.7). The pole is close to the Cretaceous poles of the

Figure 2. Orthogonal projections (a–c) of typical specimens from the sills. A corresponding equal-area projection and a normalized magnetization versus temperatures plot are displayed in (c). Specimens are plotted in geographic coordinates. Isolated hard component (HC) is indicated by gray vectors. NRM = natural remanent magnetization; M = Magnetization; $M_{max} = $ Maximum of magnetization. In situ (d) and tilt-corrected (e) equal-area projections of the site-mean HC directions from the sills (green and light green) and the baked siltstones (orange). Solid (open) symbols mark positive (negative) inclinations. (f) The equal-area projection of the 15-site virtual geomagnetic poles (VGP) from the sills and the mean pole (marked by a blue star) averaged from them; Solid (open) symbols indicate the poles are in the upper hemisphere (lower hemisphere). The circles show the 95% confidence of the poles. (g) The schematic diagram shows the distribution of the sampling sills and the sites of baked siltstones in the Guzhang area. Green, gray and pink colors represent the sills, gray-greyish green siltstones and red beds, respectively. (h) Orthogonal projection of a representative specimen from the baked siltstones in situ. The direction of the HC marked by gray arrows is similar to that of the sills GZS01 and GZS02.

Cogné (2003), Enkin (1990), and Jones (2002). Principal component analysis was used to separate the paleomagnetic components (Kirschvink, 1980) and Fisher statistics were used to calculate mean directions (Fisher, 1953).
SCC (pole B, Figure S6b in Supporting Information S1), suggesting the component could be a Cretaceous remagnetization. The Cretaceous overprint can also be identified in the sedimentary samples of the Nantuo Formation in the Guzhang area (Zhang et al., 2013) and the Madiyi Formation in the Zhijiang area (Xian et al., 2020). In the Anjiang area, the soft component was isolated below 400°C, the in situ directions of which are close to the present-local field (Figure S3c in Supporting Information S1). We thus suggest that it is likely to be a recent VRM. The hard component (HC), which can be determined in the steps between 25 and 100 mT with AF demagnetization (Figure S2e in Supporting Information S1), unblocks usually around 580°C with a few samples of sill AJSO1 having unblocking temperatures between 530 and 580°C (Figures 2a–2c and Figure S2 in Supporting Information S1). The coercivity of remanence and the unblocking temperatures of the HC are consistent with rock magnetic results (see in Figure S4 and Text S1 in Supporting Information S1) that suggest the major magnetic carrier is pseudosingle domain magnetite. The HC directions from the Guzhang sills point down with very steep inclinations after tilt correction (Figure 2e and Figure S5 in Supporting Information S1). Meanwhile, the HC directions from the Anjiang sills are directed upward also with steep inclinations, being antipodal to those of the Guzhang sills after tilt correction (Figure 2e and Figure S5 in Supporting Information S1). The HC directions in the two areas jointly pass a positive McFadden (1990) fold test at both the 95% and 99% confidence levels (critical “Xi” 95% (99%) = 4.51 (6.305); “Xi 2” IS = 9.227, “Xi 2” TC = 0.3836; Table S1 in Supporting Information S1) and a C-class reversal test (γc = 15.5° < γp = 15.8°, for more details see the data in Table S1 in Supporting Information S1) based on McFadden and McElhinny (1990).

Baked samples were collected from two sites in the gray siltstone of the Wuqiangxi Formation, which host three sills in the Guzhang area (Figure 2g), and were all subjected to stepwise thermal demagnetization. The samples also have two paleomagnetic components (Figure 2h and Figure S2f in Supporting Information S1). The low temperature one, which is similar to the soft component “B” from the Guzhang sills, is of a Cretaceous remagnetization (Figure S3d in Supporting Information S1). The high temperature component is the same as that of the Guzhang sills in direction (Figure 2e and Figure S5 in Supporting Information S1). The unbaked purple samples collected far from the sills in the area failed to isolate any stable high temperature component. Nonetheless, previously published paleomagnetic results from the sections of the Wuqiangxi Formation which are ~75 km away from the Guzhang sills are distinct from those of the sills (Xiao, 2015; Figure S6a in Supporting Information S1). In the Guzhang area, ~5 km away from the sills, the red beds of the Madiyi Formation that underlies the Wuqiangxi Formation also yield distinct paleomagnetic directions compared to those of the sills (Xian, 2017; Figure S6a in Supporting Information S1). In addition, the NRM intensities of the baked siltstone samples are mostly higher than those of the unbaked samples and the sedimentary rocks from the Banxi Group in the region by one or two orders of magnitude (Figure S7 in Supporting Information S1), which suggests that the baked rocks may acquire the thermal magnetization during baking and provides corroborating evidence that the direction of the sills represents a thermoremanent magnetization (Meng et al., 2022). While neither the samples from the distant or slightly different aged host rocks constitute a conventional baked-contact test, they serve the purpose of excluding the possibility of regional remagnetization, thus strongly suggesting the remanence of the sills is of primary origin.

The mean pole by averaging the virtual geomagnetic poles (VGPs) of the 15 sites is located at 25.6°N, 116.8°E (A5 = 9.9°, Figure 2f). Considering that only a spot reading of the geomagnetic field can be recorded by each rapidly cooled sill (Tauxe, 1993) and also that only seven sills were sampled, the issue of paleosecular variation (PSV) should be addressed. We have calculated the scatter of the 15-site VGPs following the method proposed by Biggin et al. (2008), which is 20.4 ± 3.3°, overlapping the expected range from 20.7 to 27.2° (for the reference point at 28°N, 110°E with a paleolatitude of 83.5°) based on the PSV model derived from Veikkolainen and Pesonen (2014). The A5 is also within the A5 envelope (A5min = 4.1°, A5max = 14.9°, Deenen et al., 2011). All the tests indicate that the pole obtained from the Guzhang and Anjiang sills has averaged out PSV. Along with the positive fold test, satisfactory reversal test, regional baked-contact test, and its significant difference from the younger poles of the SCC (Zhang et al., 2015, 2021; Figure S6b in Supporting Information S1), the new pole satisfies an R-score of seven in the revised paleomagnetic data quality criteria (Meert et al., 2020), and can hence be considered as a reliable pole for SCC at ca. 770 Ma.
4. Discussion

The new paleomagnetic pole places the SCC in very high latitudes (>83° for the sampling sites) at ca. 770 Ma. The pole from the ca. 770 Ma MIS in India also indicates a mid-to-high-latitude position for India (Georgy et al., 2009; Meert et al., 2013; Torsvik, Carter, et al., 2001). The new data permit a reconstruction in which the SCC can be linked with India with the western side of the SCC facing the Himalaya margin of India (Figure 3). The model, however, presents a considerable gap between the two continents, which may accommodate some other continental blocks. We suggest that the small blocks in present southeastern Asia, such as Indochina, Lhasa, and South Qiangtang blocks can be candidates for the linkage between the SCC and India (Figure 3). That interpretation can be supported by the geological and geochemical evidence published in recent years (Figure 3b). (a) The Neoproterozoic igneous rocks with similar ages and arc-affinity features are distributed in northern Lhasa, northwestern Indochina, and northeastern Indochina. They are considered to have been generated in subduction-related settings, which probably were part of the active continental margin system recognized in the western to northwestern SCC, northwestern India, Seychelles, and Madagascar (e.g., Hu et al., 2018; Kang et al., 2019; Qi et al., 2014). (b) Detrital zircon ages derived from the Neoproterozoic strata of Indochina and northwestern India show similar peaks at ca. 0.95, 1.75, and 2.5 Ga, source provinces that could supply for the detrital zircons (Kang et al., 2019). (c) The provenance analysis performed on the ca. 800 Ma Nyainqentanglha Group suggests the Lhasa terrane was in the vicinity of the Indian Himalaya region, based on the common source deduction for the 1.3–1.6 Ga zircons among it and the metasedimentary rocks of the Namche Barwa Complex in northeastern India (Zhou et al., 2019). The 1.3–1.45 Ga zircons and 1.5–1.6 Ga zircons were possibly from the corresponding Mesoproterozoic rifted-magmatism in southeastern India and the orthogneisses in the Namche Barwa Complex, respectively (Guo et al., 2017). (4) If the ca. 1,100–1,000 Ma Tongka complexes that metamorphosed from paragneisses or granitoids to granulites in ca. 950–900 Ma in the far eastern part of South Qiangtang terrane can be

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**Figure 3.** (a) Paleocontinental reconstruction at ca. 770 Ma based on the paleomagnetic poles from the ca. 770 Ma Guzhang-Anjiang (GZ-AJ) sills in the south China craton (SCC), ca. 770 Ma Malani Igneous Suite (MIS) in India, ca. 775 Ma Gunbarrel large igneous province in Laurentia and ca. 775 Ma mafic dykes in north China craton (NCC). Indochina, Lhasa, and South Qiangtang blocks are placed based on the geological evidence stated in the text. The positions of Seychelles, Madagascar and Rayner relative to India are adopted from Torsvik, Ashwal, et al. (2001) and Li et al. (2008). For other continents in the reconstruction, their positions are according to Ding et al. (2021). (b) Zoom out of the SCC-India tectonic entity showing the key geological evidence. The paleomagnetic poles with 95% confidence circles are plotted in the same color as that of their continents. CB = Cathaysia block; YB = Yangtze block; (e) E. Lhasa = Eastern Lhasa; S. Qiangtang = South Qiangtang.
correlated to the Eastern Ghat Belt and Raner provinces (Yuan et al., 2017), the South Qiangtang terrane could be close to India in Neoproterozoic. The speculation is further supported by the similarities of provenance and petrology between the ca. 550 Ma Dabure clastic rocks in the South Qiangtang and coeval strata in the Himalayan (Wang et al., 2016).

Although multiple lines of geological evidence support the reconstruction placing the Indochina, eastern Lhasa, and south Qiangtang blocks in between the SCC and India, it is possible that other blocks played as the linkages. A model was recently proposed by Wang et al. (2022) in which the south Tarim was placed against the Himalaya margin of India based on the detrital zircon analyses of the Neoproterozoic-Paleozoic strata. In other models, however, Tarim was also putatively placed close to northwest Australia (e.g., Zhao et al., 2021; Zhang et al., 2015), between Australia and Laurentia (Wen et al., 2018), or near Siberia (Eyster et al., 2020). In fact, the current paleomagnetic data are still not enough to determine the paleogeographic affiliation of Tarim. For the Lhasa block, Zhu et al. (2011) suggested that it was adjacent to northwest Australia instead of India in Gondwana based on the detrital zircon provenance analyses of the Paleozoic strata, but whether the Lhasa-Australia affinity was valid in Neoproterozoic remains uncertain.

In some previous models, the poles from the Liantuo Formation have been matched with the MIS pole, resulting in a tight juxtaposition of the SCC and India (Evans, 2009; Jing et al., 2021; Zhang et al., 2013). The ages of the Liantuo Formation poles, however, remain highly controversial, which lowers the grade of the poles and excludes them for reconstruction purposes. Because of the significant difference between the Liantuo poles and the ca. 770 Ma pole reported here (Figure S6b in Supporting Information S1), we suggest that the Liantuo poles are unlikely to be ca. 770 Ma in age. Reported ca. 824-800 Ma paleomagnetic data (Jing et al., 2020; Li et al., 2004; Niu et al., 2016; Park et al., 2021; Xian et al., 2020) and the ca. 770 Ma pole all indicate a high latitudinal position for the SCC. But the poles from the Liantuo Formation reveal significantly lower latitudes (Evans et al., 2000; Jing et al., 2015, 2021). Park et al. (2021) reported a precise zircon U-Pb age at 779.52 ± 0.26 Ma, through the use of the CA-ID-TIMS (chemical abrasion isotope dilution thermal ionization mass spectrometry) method, from a tuff bed ∼15 m below the paleomagnetic sampling horizon of the upper Liantuo Formation in Evans et al. (2000). If the dating results do represent the stratum age rather than detrital materials, the age of the lower Liantuo Formation should be older than ca. 780 Ma, and the poles obtained from the Liantuo Formation thus far should be >10 Myr older than our ca. 770 Ma pole. In this case, the SCC could experience a latitudinal oscillation sometime between ca. 800 and 770 Ma, which needs more paleomagnetic and geochronological work to verify. Alternatively, the poles from the Liantuo Formation could be younger than ca. 770 Ma because considerable ca. 730-714 Ma zircons have been identified in the upper part of the Liantuo Formation (e.g., Du et al. 2013; Gao & Zhang, 2009; Lan et al., 2015) and there is no sufficient evidence to conclude that all these younger zircon grains are poorly dated or suffer from Pb loss. In this case, a simple southward motion of the SCC from polar to equatorial regions since at least ca. 770 Ma to the Cambrian seems more acceptable (Zhang et al., 2021).

The possible inclination shallowing of the red beds in the Liantuo Formation is another problem that has not been solved. If the age range of the Liantuo Formation overlaps with the age of the ca. 770 Ma sills, the paleolatitudinal discrepancy between the ca. 770 Ma sills and the Liantuo Formation implies that the common flattening factor of f = 0.6 used in Park et al. (2021) to correct the inclination shallowing of the Liantuo Formation is still insufficient. However, more intense inclination shallowing of the Liantuo Formation has not been detected. Consequently, our pole obtained from the well-dated mafic sills that do not suffer from any inclination shallowing is more proper for paleogeographic reconstruction.

The new ca. 770 Ma paleomagnetic pole of the SCC is almost coeval with the key poles obtained from the ca. 775 Ma Gunbarrel large igneous province in Laurentia (Eyster et al., 2020, and references therein) and the pole of the ca. 775 Ma mafic dykes in the north China craton (NCC; Ding et al., 2021), providing an opportunity of direct comparison between these paleocontinents. The comparison demonstrates that the mid-to-high latitudinal SCC-Indochina-India landmass was far away from the equatorial Laurentia and the low latitudinal NCC, as well as the major continents located close to Laurentia in some prevailing Rodinia models (Figure 3a). This configuration is consistent with that in some recent Rodinia models, which place the SCC separate from the majority of Rodinia (Jing et al., 2020; Merdith et al., 2017; Park et al., 2021; Xian et al., 2020). Such separation may have existed since before ca. 800 Ma (Xian et al., 2020) according to the paleomagnetic comparison between the Madiyi pole of the SCC and the poles of the Grusdiebreen and Svanbergfjellet formations in the East Svalbard terrane. Considering the uncertainties to reconstruct East Svalbard to Laurentia (Gee & Teben’kov, 2004; Maloof
et al., 2006), the ca. 770–775 Ma poles in the updated global database have provided much more paleomagnetic confidence in the reconstruction of Rodinia.

Our reconstruction lines up a putatively continuous subduction zone along a meridian from the pole down to mid-to-low latitudes (Figure 3a). It is worth noting that some authors have speculated about the presence of a subduction zone at this time outboard of the western margin of Australia-Mawsonland (e.g., Meredith et al., 2017). Although direct evidence has not yet been available there, an oceanic arc that has a much lower preservation potential than a continental one (like in SCC-India) may have existed. Ambiguities aside, such a “ring of fire” of subduction outside the continental hemisphere has a neotectonic basis in the modern Pacific Ocean. Additionally, circum-supercontinent subduction theoretically must occur somewhere assuming seafloor spreading in the external Mirovoi Ocean was presumably ongoing to preserve surface area. If true, the two subduction zones might have connected as a whole to constitute a nearly pan-latitudeal, Cordillera-like subduction girdle along the western edge of Rodinia (Figure 3a), where the slab rollback may have played a critical role in the breakup (Bercovici & Long, 2014) of Rodinia and the succeeding formation of Pangea. This configuration is worthwhile testing.

5. Conclusions

A new paleomagnetic pole (25.6°N, 116.8°E, $A_{95} = 9.9^\circ$, $N = 15$) was newly obtained from the ca. 770 Ma mafic sills in the SCC. It passes a positive fold test, a satisfactory reversal test, adequately averages PSV, and is significantly different from the younger poles in the region and the younger SCC poles. The regional baked-contact test also serves the purpose of excluding the possibility of regional remagnetization. The data together with the coeval poles in the global paleomagnetic database and geological evidence support a reconstruction in which the SCC was connected with India at ca. 770 Ma via linkages with some smaller Asian blocks. The SCC-India tectonic entity occupied a mid-to-high position, being far away from the equatorial Laurentia which is regarded as the center of Rodinia, and its low latitudinal neighbors at ca. 770 Ma.

Data Availability Statement

Data to support this study are presented in Supporting Information S1 and are also available in Zenodo (https://doi.org/10.5281/zenodo.6535110).

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