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Where was the deformation of East Asia due to the India-Asia collision extended into ? (2)

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Previous paleomagnetic studies suggest that the South China Block (SCB) is divided into two bodies by collision of India with Asia; slightly deformed and stable bodies. Two ideas for cause of tectonic deformation are proposed; local rotation (Gilder et al., 1993) and differential extrusion of some dissected zones in a similar pattern to the Indochina Block (Liu and Morinaga, 1999). Kawamura et al. (2009) carried out paleomagnetic investigation to re-evaluate the cause of tectonic deformation and to set the boundary between the deformed and stable bodies. As the result, the mean characteristic remanent magnetization (ChRM) directions were different between sampling sites in the western and eastern parts of a sedimentary basin located south of Nanning, Guangxi Province. This observation suggests that the western and eastern parts are included in the deformed and stable bodies, respectively, and also that the boundary between both bodies is situated between the western and eastern parts. We performed further paleomagnetic investigation to ascertain this expectation. Paleomagnetic samples were collected at 12 sites of the eastern part. The higher temperature components (HTCs) isolated from all specimens were regarded as ChRMs. The optimal concentration of mean ChRM directions calculated using the direction-correction tilt test (Enkin, 2003) was achieved at 52.1 per cent untilting. These incompletely untilted magnetizations were judged to be syn-tilting magnetizations taking into consideration an acquisition model (Tsuneki et al., 2009). The mean virtual geomagnetic pole (VGP) for the eastern part obtained from the syn-tilting magnetizations was concluded as the early Cretaceous paleomagnetic pole (80.6 degrees N, 158.5 degrees E, A_{95}=6.4 degrees). Both the paleopoles for the western (85.6 degrees N, 60.9 degrees E, A_{95}=3.4 degrees) and eastern parts are different from the Cretaceous paleomagnetic pole from the stable body of the SCB (78.8 degrees N, 214.4 degrees E, A_{95}=2.6 degrees; Tsuneki et al., 2009). These differences can be explained by 15.0+/-3.7 (3.5+/-6.2) degrees counter-clockwise rotation and 6.4+/-3.4 (9.1+/-5.5) degrees southward translation of the western (eastern) part against the stable body of the SCB. Although the rotational value is different from each other, attitude of southward translation is almost similar to each other. Thus, this observation suggests that the eastern part is also included in the deformed body. The VGP of one site in a sedimentary basin located east of the studied area (Gilder et al., 1993), agrees well with the Cretaceous paleomagnetic pole from the stable body of the SCB. Therefore, the boundary between the deformed and stable bodies is located between the studied area and the sedimentary basin located east of it.

Keywords: paleomagnetism, red sandstone, Cretaceous, South China Block, extrusion tectonics, India-Asia collision