

Past continental shape inferred from GPS data part 2

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Kawai et al.,2014 JpGU applied a method of Harada and Kato(AGU Fall Meeting 2012), and calculated about 50Ma shape of the south American continent from GPS data, and compared the shape with early tertiary shape of south American continent estimated by paleomagnetic analysis of Kono et al.,1985. The result was quite similar with each other and this implies 20 years of GPS data is comparable with million year scale crustal deformations.

We applied a same method as Kawai et al.,2014 with more GPS data and calculated past and future shapes of all continents of earth.

For quantitative examination of the results above, we used about 14 paleomagnetic data from Kono et al.,1985 and Randall et al.,1996 and compared the rotation angles with calculated rotations from GPS data at same age and locations.

Although the error sizes for GPS extrapolation and ages of paleomagnetic data are large, a positive correlation between paleomagnetic and GPS rotations are shown in this study. This also implies 20 years of GPS data is comparable with million year scale continental deformations. However, 3 out of 14 paleomagnetic data we used have a negative correlation between paleomagnetic and GPS rotations. This may show that there are some limits for our methods of analysis and that GPS data is incomparable to paleomagnetic data at certain time ago or at certain locations.

Keywords: GPS, Past continental shape, Paleomagnetic data

