



Tectonic link between NE China and Korean Peninsula, revealed by interpreting CHAMP satellite magnetic and GRACE satellite gravity data

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The major continental blocks in NE-Asia are the North China Block and the South China Block, which have collided, starting from the Korean peninsula. The suture zone in NE China between two blocks is well defined from the Qinling-Dabie-Orogenic Belt to the Jiaodong (Sulu) Belt by the geological and geophysical interpretation. The discovery of high pressure metamorphic rocks in the Hongsung area of the Korean peninsula can be used to estimate the suture zone. This indicates that the suture zone in the Jiaodong Belt might be extended to Hongsung area. However, due to the lack of geological and geophysical data over the Yellow sea, the extension of the suture zone to the Korean peninsula across the Yellow Sea is obscure. To find out the tectonic relationship between NE China and the Korean peninsula it is necessary to complete the homogeneous geophysical dataset of NE Asia, which can be provided by satellite observations. The CHAMP lithospheric magnetic field (MF3) and CHAMP-GRACE gravity field, combined with surface measured data, allow a much more accurate inference of tectonic structures than previously available. The CHAMP magnetic anomaly map reveals significant magnetic lows in the Yellow Sea near Nanjing and Hongsung, where are characterized by gravity highs on the CHAMP-GRACE gravity anomaly map. To evaluate the depth and location of potential field anomaly causative bodies, the Euler Deconvolution method is implemented. After comparing the two potential field solutions with the simplified geological map containing tectonic lines and the distribution of earthquakes epicenters, it is found that the derived structure boundaries of both are well coincident with the seismic activities as well as with the tectonic lineaments. The interpretation of the CHAMP satellite magnetic and GRACE satellite gravity datasets reveal two tectonic boundaries in the Yellow Sea and the Korean

peninsula, indicating the northern and southern margins of the suture zone between the North China Block and the South China Block. The former is extended from the Jiaodong Belt in East China to the Imjingang Belt on the Korean peninsula, the latter from Nanjing, East China, to Hongsung, the Korean peninsula. The tectonic movement in or near the suture zone might be responsible for the seismic activities in the western region of the Korean Peninsula and the development of the Yellow Sea sedimentary basin.