

ANALYSIS OF SECULAR VARIATIONS OF GEOMAGNETIC FIELD AND HORIZONTAL GRADIENT IN CHINA USING IGRF10

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Based on the model of IGRF10, the spatio-temporal changes of the total intensity (F), the declination (D) and the inclination(I) in China 70-140°E 15-55°N from 1900 to 2010 were analyzed. The annual rate of F and I for every 5 years in each grid (1°×1°) were calculated. The gradients of F in south-north direction were calculated using difference method and their secular variation were analyzed. The main results showed that the annual rate of F in all grids were positive during 1935-1950 and 1995-2010 and negative during 1965-1975 and evidently higher during 1940-1955 than other years. The annual rate of I were positive during 1900-1940 and 1970-2010 and negative during 1955-1970 in most grids. The annual rate of I and their distribution during 1940-1955 were evidently different with other years. D was negative in east and positive in west. The agonic lines of D were in near 100°E and moved from east to west for 1900-2010. The average of D in 110°E was -0.49 degree in 1900 and -4.01 degree in 2010. In 40°N, agonic line of D was in 106.19°E in 1900 and in 94.41°E in 2010. The agonic line of D moved westwards about 0.1 degree every year on average. There was a high positive value centre of the gradient of F in south-north direction in middle. The maximum value of the gradient was 10.35nT/min. in 1900 located in 106.75°E and 32.19°N and 9.69nT/min. in 2010 located in 107.14°E and 30.39°N. The high positive value centre of the gradient of F in south-north direction decreased and moved southeastward from 1900 to 2010.

IGRF10, secular variation, horizontal gradient of geomagnetic field

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