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菲律宾及其邻近地区的地磁场模型研究

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The study of magnetic field models for Philippines and its neighboring regions

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摘要

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摘要 根据2001~2007年期间在菲律宾境内测量的74个点的地磁场数据,利用球冠谐和、泰勒多项式两种方法建立了2005.0菲律宾及周边地区地磁基本场模型,得到了菲律宾地区 X 、 Y 、 Z 、 D 、 I 、 H 、 F 七个分量的分布.两种模型反映的同一地区的地磁场分布形态基本类似,只在拐点的舒缓度、等值线平滑度等方面存在区别.在 8°N 左右, X 、 H 、 F 出现系统的拐点,同纬度的 X 、 H 、 F 东低西高, D 、 Y 零线分布于 8°N 左右呈东西展布,北侧为负,南侧为正,等值线沿经度分布的同时,在纬度上有不同程度的小起伏. Z 、 I 空间分布呈现更加规则均匀的东西向分布特征.零线分布在 7.5°N 左右,零线北部是正值区域,南部是负值区域.两种模型与IGRF的差值的分布形态有很大的不同,球冠谐模型与IGRF模型差值的正负异常区域呈现正负异常相间的分布特征,且各分量的正负异常最大值分布在低纬度地区.而泰勒多项式与IGRF差值的正负异常分布却相对完整.

关键词: 菲律宾地区 地磁场 球冠谐模型 泰勒多项式模型

Abstract: According to the magnetic field data at 74 survey sites measured in the Philippines during 2001~2007, and using two methods of spherical cap harmonic and Taylor polynomial, we established magnetic field model on 2005.0 epoch for Philippines and the surrounding regions and got the distribution of the seven components of X , Y , Z , D , I , H , F . The distribution is similar in the two models, the difference is in the relief of inflection point and contour smoothness. At about 8°N , X , H , F have turning point and they are higher in west than in east. D , Y zero line extends approximately along latitude 8°N , the northern side of the line is negative and the southern part is positive, while the distribution of the contours is along the longitude direction, with minor variation along latitude direction. The distribution of Z and I is more regular, the zero-line is along 7.5°N , and the value is positive in northern region and negative in southern regions. The distribution patterns of the difference between the two models with the IGRF are very different, the value of spherical harmonic model minus IGRF model revealed a feature of alternative positive and negative anomalies, and the maximum positive and negative anomaly value of each component is in low latitudes. The anomaly distribution of Taylor minus IGRF is smoother.

Keywords: Philippines region Magnetic field Spherical harmonic model Taylor model

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