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论文

地质统计学在气象要素场插值的实例研究

常文渊

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摘要： 对两种气象要素场数据分别用距离平方反比法、三次B样条和克里格（Kriging）法插值计算.比较了三种方法结果的差异和当计算场满足不同类型克里格数学假设前提下，普通克里格法（OK）与泛克里格法（UK）插值结果的异同.结果表明：克里格法的误差普遍偏小，且在插值区域峰值处克里格法的最大绝对误差和残差方差均可能较样条的小，说明只要充分了解研究区域特点，恰当选用参数，克里格法有可能得到优于样条的结果，而距离平方反比法和克里格法用全场数据插值不如使用局部数据插值的精度高，则表明内插计算具有局域性.同时还发现，虽然插值场是否满足克里格法假设对插值结果存在影响，但这种影响有时并不重要，它依赖于插值场的性质.

关键词： 地质统计学 克里格插值 B样条 气象要素场

A CASE STUDY OF GEOESTATISTICAL INTERPOLATION TO METEOROLOGICAL FIELDS

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Abstract: We apply a Kriging interpolation, a geostatistic method, to meteorology and compare it with other traditional interpolations, i.e. the spline interpolation and the method whose weight is inversely proportional to the distance to a power. Two meteorological fields used in the paper are the sea surface pressure field and the geo potential height field on 500 hPa, respectively. An ideal field with a sharp variation is also used in our numerical investigation. The numerical results show that the Kriging is more accurate than the other two methods used if related parameters are well set and only the sampling points located in a small area around the estimated points. Even for the interpolation around the sharp area the Kriging still behaves well, while others did not. On the boundary of the interpolation field, there exist big errors for the spline while not for the Kriging. The results also indicate that the accuracy of the Kriging is not sensitive to stationary assumption. Though some preprocess may improve the field stability, it cannot always raise the accuracy of the Kriging