论文

基于无线电探空资料反演大气水汽资源的垂直层结特征

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摘要：

利用1999—2009年的探空资料分析北京地区对流层大气水汽资源的垂直层结特征,采用韦伯和指数分布拟合大气水汽密度的概率密度函数。初步结果表明,各层拟合均通过卡方拟合优度检验,拟合相关系数高,精度高,均方根误差小;韦伯和指数拟合平均相关系数分别为0.93、0.95;拟合均方根误差分别为0.009、 0.01 g/m^3,北京地区大气水汽资源的垂直分布符合指数分布规律;有降水时,对流层水汽密度有一定的垂直层状结构,无降水时,水汽密度随高度增加递减。

关键词： 大气水汽资源　无线电探空　韦伯分布　指数分布

Water Vapor Resource Vertical Stratification Characteristics Retrieved Basing on the Radiosonde Datum

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Abstract:

The paper analyzes the water vapor vertical stratification characteristics in Beijing using the radiosonde datum from 1999 to 2009 and uses the Weibull and exponential distribution to fit the water vapor content probability density to study the vertical distribution of the atmospheric water vapor content. The preliminary results is as follows: all the fitting passed the chi-square goodness of fit test with good correlation coefficients, high accuracy and low root mean square errors; average fitting correlation coefficients of Weibull and exponential distribution were 0.93 and 0.95 respectively; and the fitting root mean square errors were 0.009 and 0.01 g/m^3 separately. The vertical distribution of atmospheric water vapor resource of Beijing agreed with Weibull distribution. The water vapor content agreed with some stratification structure on rainy day and decreased with the height on sunny day.

Keywords: atmospheric water vapor resource　radiosonde　Weibull distribution　exponential distribution

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