

论文

### 腾冲火山区的GPS形变特征

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**摘要** 利用腾冲火山区2003和2004年2次测量所得的GPS数据, 计算了59条测线的水平长度变化. 对任意相邻的3个测点和3条测线组成的51个三角形, 分别进行了地壳形变的反演计算, 得出每个三角形的主应变和主方向, 进而确定每个三角形的面膨胀量和最大剪应变. 对整个测量区域作等值线图, 可以看出有3个最大值的区域, 分别位于马站一曲石(G05)附近; 腾冲(G20)一热海(G13)附近, 以及五合(G15)一团田(G18)附近. 这3个区域与3个具有最大相对地热梯度的区域相一致, 也与低速异常体所在的区域相一致. 因此可能就是地下岩浆房存在的区域. 为了确定岩浆活动性, 利用Mogi模型的计算公式, 对腾冲一热海附近的区域进行了反演, 认为等效源的位置在腾冲的西南方向, 岩浆活动量约为 $8 \times 10^{-5} \text{m}^3/\text{a}$ , 与以前用精密水准测量的垂直形变所反演的结果处于同样的量级.

**关键词** [腾冲火山](#) [GPS测量](#) [面膨胀](#) [Mogi模型](#)

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### Research on the character of the GPS deformation in the Tengchong volcano area

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**Abstract** The varieties of the horizontal length of 59 measurement lines are calculated by using the GPS data between 2003 and 2004 in the Tengchong area. The crust deformation of the 51 triangles made by every 3 points and lines are inversed respectively, their main strain and main orientation of each triangle are obtained, then the area expansion and the maximum shear strain of each triangle are determined. In the isoline chart of the whole measured area, there are three maximum areas which lie in Mazhan to Qushi(G05), Tengchong(G20) to Rehai(G13) and Wuhe(G15) to Tuantian(G18). These 3 areas are consistent with the areas having maximum relative geothermal grads and also consistent with the areas having low-velocity abnormality. Thus, there are likely to be the areas where the magma located. To estimate the activity of the magma, the Mogi model and inversion method are used to Tengchong-Rehai area and find that the equivalent magma fountain locats in the southwest of Tengchong. The movement amount of the magma is about  $8 \times 10^{-5} \text{m}^3/\text{a}$ , which accords well with the former inversion result using leveling deformation.

**Key words**

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