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» Abstract

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| Title of the Paper | Contribution of thermal expansion of monument and nearby rock to observed GPS height changes |
| Abstract | <p>Long-term continuous GPS observation has become an important tool for studying various geodynamic processes. To fully reflect the geodynamic processes at GPS stations, the temporal movements of GPS monuments and nearby rocks induced by thermal expansion have to be removed. In this paper, we extend a theoretical model to estimate the thermal expansions of GPS monuments and nearby rocks based upon the measurements of surface temperatures. The results show that the annual temperature variations are the dominant contributions for the thermal expansion of GPS monuments and nearby rocks. The contributions of thermal expansion to GPS height changes are approximately proportional to the latitude, the higher the latitude, the larger the contributions. The most significant region influenced by thermal expansion is North Asia. As examples, we estimate the thermal expansion effects on GPS height changes at Jiufeng and Fangshan stations, China, and the model's predictions agree well with the GPS observations.</p> |

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