地球物理学报 2003 46 (1): 54-61 ISSN: 0001-5733 CN: 11-2074/P

论文

广东地区地震动衰减和场地响应的研究

黄玉龙

1 香港理工大学土木与结构工程学系，香港。2 中国地震局分析预报中心，北京 100036。3 Institute of Geological and Nuclear Science, Gracefield, Lower Hutt, New Zealand。4 广东省地震局，广州 510070

收稿日期 2001-5-17 修回日期 2002-4-10 网络版发布日期 接受日期

摘要 根据广东数字地震台网14个地震台的249条波形资料，研究了广东地区的衰减模型和各台站的场地响应. 采用三段几何衰减模型拟合，得到了广东地区的几何衰减函数. 同时也采用线性几何衰减模型和两段几何衰减模型对观测数据进行了拟合. 残差比较表明，线性几何衰减模型的残差最大，两段几何衰减模型的残差其次，而三段几何衰减模型的残差最小. 由此可以推论广东地区采用三段几何衰减模型具合理性和适用性. 得到广东地区非弹性衰减Q值随频率f的关系为Q(f)=481.5·f0.31；14个台站的场地响应均没有显示出明显的放大效应，这与它们均处于岩石地基相符.

关键词 广东地区 地震动衰减 场地响应 几何衰减函数 Q值

分类号

DOI:

ATTENUATION OF GROUND MOTION AND SITE RESPONSEIN GUANGDONG REGION

WONG YUKLUNG

1 Department of Civil and Structural Engineering, Hong Kong Polytechnic University, China。2 Center for Analysis and Prediction, China Seismological Bureau, Beijing 100036, China。3 Institute of Geological and Nuclear Science, Gracefield, Lower Hutt, New Zealand。4 Seismological Bureau of Guangdong Province, Guangzhou 510070, China

Received 2001-5-17 Revised 2002-4-10 Online Accepted

Abstract Based on 249 horizontal component digital seismograms recorded on 14 stations of Guangdong Telemetered Network, the attenuation of ground motion and site response of each station is investigated. Assuming a trilinear geometrical spreading model, we obtained the attenuation function in Guangdong region. The same dataset also used tried to fit both linear and bilinear geometrical spreading models. The comparison of the residuals of the results for these models shows that the residual is biggest for linear model, medial for bilinear model, and the smallest for trilinear model. It is suggested that the trilinear geometrical spreading model is reasonable and suitable for Guangdong region. The frequency dependent Q in the Guangdong region is estimated as Q(f)=481.5·f0.31. The site responses do not show significant amplifications, which is consistent with their basement on rocks.

Key words Guangdong region; Attenuation of ground motion; Site response; Geometrical spreading function;Q value.

通讯作者:
ceylwong@inet.polyu.edu.hk
作者个人主页: 黄玉龙