AOGS 2006


# A New Model for Fast Assessment of Earthquake Damage and Losses Based on Macroecnomic Indicators (GDP) in Chinese Mainland

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1 Basic model According to the principle of earthquake based on macroecnomic indicators(GDP) (Chen Yong et al. , 1999, 2001, 2002), the basic model is: LOSS=∑P(I)F(I, GDP)GDP, where F(I, GDP) is a measure of the area's vulnerability to earthquake damage, P(I) is the hazard probability and the total loss is the sum of the loss at different intensity level in the given area.2 Data collection and analysis We collect 207 earthquakes occurred in Chineses Mainland which had corresponding original reports of earthquake damage and losses assessment since 1989 to 2004(State of Seismic Bureau, State statistical Bureau, 1996; China Earthquake Administration, 2001; Lou Baotang, 1996;Zhang Zhaocheng, 2000; Chen Qifu, 2002; Reports of earthquake damage and losses assessment in each province). We first make isoseismal maps(MMI) of each event digital, then divide each isoseismal maps(MMI) to Ⅵ, Ⅶ , Ⅷ, Ⅸ, Ⅹ and separately give each intensity grade corresponding attributes(such area, population, GDP, et al.) . Finally, we can get 158 group digital isoseismal maps(≥Ⅵ) which has either spatial geographical attribute or database attribute.3 Loss and death distribution If people death and losses can be gotten in original reports of earthquake damage and losses assessment, we directly distribute the value of death and losses to the corresponding isoseismal maps (such as isoseismal area of Ⅵ); if people death and losses can not be gotten in the reports, we adopt a new distribution methods to settle this problems.4 The new earthquake vulnerability model MDF=AI^B, where MDF is total losses, I is intensity , A, B is modulus.