

## Investigating Subsurface Structures and P- and S-wave Velocities in the Taipei Basin

Chien-Ying Wang<sup>1,\*</sup>, Yi-Hen Lee<sup>1,2</sup>, Mang-Long Ger<sup>3</sup>, Yi-Ling Chen<sup>1</sup>

(Manuscript received 5 February 2004, in final form 30 July 2004)

### ABSTRACT

Over the past 10 years, the Central Geological Survey (CGS) has conducted a wide-range of investigations of the Taipei basin by drilling over 30 wells (100 - 700 m). During the same period, we have also scanned the basin area (20 × 20 km) using over 300 shallow reflection seismic lines. The purpose of this paper is to compile these seismic data, incorporating it with the borehole drilling results, to better describe the Tertiary basement, and the Quaternary layers above the basement including their respective P- and S-wave velocities. It is found that 1) the deepest part of the basin basement is probably at the outlet of the Tanshui River, i.e., at the NW corner of the basin, 2) the Kanchiao fault forms a separation boundary bisecting the basin into a deep NW part and a shallow SE part, 3) the Sungshan and Chingmei Formations are relatively flat deposits at the top, which implies the existence of a comparatively quiet deposition period since about 100 thousand years ago, 4) the P- and S-wave velocities inside the basin are 1500 - 2200 m s<sup>-1</sup> and 170 - 880 m s<sup>-1</sup>, and 3000 m s<sup>-1</sup> and 1500 m s<sup>-1</sup> for the basement.

(Key words: Taipei basin, Shallow reflection seismics, Basin structure, P and S velocities)

### 1. INTRODUCTION

Taipei city, the capital of Taiwan, is located in the Taipei basin. The thick recent deposits in this “soft” basin have caused significant earthquake damage due to site amplifications, although the earthquakes have mostly occurred outside the basin (Sokolov et al. 2001). A severe building collapse caused by the 1999 Chi-Chi earthquake (M<sub>w</sub> = 7.6; epicenter 200 km

---

<sup>1</sup> Institute of Geophysics, National Central University, Chung-Li, Taiwan, ROC

<sup>2</sup> Energy & Resources Laboratories, Industrial Research Institute of Technology, Hsinchu, Taiwan, ROC

<sup>3</sup> Institute of Geography, National Taiwan Normal University, Taipei, Taiwan, ROC

\* *Corresponding author address:* Prof. Chien-Ying Wang, Institute of Geophysics, National Central University, Chung-Li, Taiwan, ROC; E-mail: wangcy@cc.ncu.edu.tw