

Seismicity change and b value variation prior to the Wenchuan earthquake (*M_s 8.0*)

*Peng Han¹, Rui Wang¹, Ying Chang¹, Miao Miao¹, Haixia Shi², Lingyuan Meng², Xuemei Zhang², Weiyun Xie³, Katsumi Hattori³

1. Southern University of Science and Technology, Shenzhen, China, 2. China Earthquake Networks Center, Beijing 100045, China, 3. Chiba University, Chiba, Japan

The Gutenberg-Richter Law describes frequency-magnitude distribution of earthquakes. A number of studies have shown that the slope (b value) of the relationship between frequency and magnitude decreased before large earthquakes. Based on the analysis of the earthquake catalog from January, 2000 to April, 2008, we have investigated seismicity change and b value variation prior to the *M_s 8.0* Wenchuan earthquake. The results show clear drops of both monthly and quarterly frequency of earthquakes during 2005-2006. The b value exhibits a long-term decrease trend since 2002, and reaches to the minimum just before the onset of the main shock. The temporal variation of b value is quite similar to that prior to the *M_w 9.0* Tohoku earthquake in Japan, which may reflect the stress evolution during the preparation process of large earthquakes. These results indicate that the b value is an important indicator of an impending great earthquake, and has high potential in terms of predicting a future large quake.

Keywords: Wenchuan earthquake, b value, seismicity