Characteristics of the social activity estimaeted from earthquake catalog

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1. Introduction

The seismic observations are influenced by ambient culture and natural noise levels. When the noises become lower, hypocenters can be determined more in number, reliably and accurately. Okada and Obara(2000) showed some examples that the number of detectable hypocenters change with urban noise levels in a day or/and a week in the Kanto and Tokai region. We show how human activities affect on the determination of earthquakes sensitively, by using hypocenter catalogs of several countries.

2. Catalogs and study areas

The catalogs and study areas analyzed in this study are respectively as follows: 1) the JMA Unified Catalog and Tokyo metropolitan area, 2) Wu et al. (2007) and Taiwan, 3) China Earthquake Data Center and Beijing metropolitan area, and 4) the Hypocenter Catalog of Istituto Geografico Nacional and Madrid metropolitan area.

3.Results

A clear daily change in the earthquake numbers is found in each area. The lowering of seismicity or rise of detectability during lunch time is found for 2 hours in Beijing and 1 hour in Tokyo. The weekly change is very clear in Tokyo and Spain, but not in Beijing. The behavior in seasonal change is different among the areas. In Beijing, the spring festival season in February and the national holiday in October are clearly observed in the catalog. In Spain, the summer vacation season is obvious in August and September. In Tokyo, the New Year vacation period about a week in January and about a vacation period about a week in May are very clearly observed.