Earthquakes result in gravity changes in the surface of the Earth. The gravity changes contain earthquake-related information, which is the basic starting point to use gravity changes to explore the mechanism of earthquakes. Since GRACE (the Gravity Recovery and Climate Experiment) satellite was launched on March 17, 2002, gravity changes by GRACE have been fully developed. The unprecedented precision of GRACE mission enables us to detect the temporal gravity variations in the Earth. GRACE will be one of the most effective methods to improve the ability of monitoring strong earthquakes.

The purpose of this paper is to study the gravity changes caused by strong earthquakes. According to the spatial resolution and the required precision for strong earthquakes, we estimate the degree variances of UTCSR release 04 spherical harmonic coefficients from GRACE satellite. The decorrelation and Gaussian smoothing method in spherical coefficients are implemented to obtain gravity changes in Chinese mainland and its vicinity. By analysing the characteristics of gravity changes before and after several earthquakes, we find some interesting relationships between earthquakes and gravity anomaly changes. The conclusion is made that the regional gravity fields are affected by several strong earthquakes and GRACE has the ability to detect gravity changes caused by strong earthquakes.