EARTH OBSERVATION SYMPOSIUM (B1)
Earth Observation Applications and Economic Benefits (5)

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THE GRACE SATELLITES DETECT RECENT EXTREME CLIMATE EVENTS IN CHINA

Abstract

As the climate changes, the extreme climates are occurring more frequently over the globe. In China, drought or flood strikes almost every year recently and there have been several disastrous events in these years. We show that some of the disastrous events are so strong that corresponding gravity change can be observed by geodetic satellites. The Gravity Recovery and Climate Experiment (GRACE), which is a joint mission between NASA and DLR, is used to obtain the temporal gravity field over China. One primary job of GRACE is to map Earth time-variable gravity field with temporal resolution of 2-4 weeeks and spatial resolution of 300km-400km. Over the years the twin satellites have observed the loss of mass in Antarctic and Greenland, strong earthquakes, severe climate change in South America and so on, which provides a unique way to study the geophysical or climatological process. In this report, the Level-2 product from the Center for Space Research is used and we focus on specific areas including lower reaches of the Yangtze river and the southern provinces of China, where drought and flood are often in these years. It is shown that with decorrelation, filter and other processes, the gravity anomalies observed by GRACE match the extreme climate events and the hydrological data from the Global Land Data Assimilation System (GLDAS).