Production of an ADEOS-II/GLI mosaic data for land cover investigation in the Central Asia

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The Advanced Earth Observing Satellite (ADEOS)-II for the purpose of under-standing earth's environmental phenomena and global climate change research was launched in December 2002 and it acquired the earth observation data for about 10 months. The Global Imager (GLI), which is a core sensor of ADEOS-II, obtained the visible to far-infrared data from the earth's surface with the 250m and 1000m spatial resolution and about 1600km swath width on the ground. Especially, the GLI has 6 bands from visible to short-wave infrared regions as well as LANDSAT/TM with the 250m spatial resolution at the nadir.

Authors examined a method to produce the wide range GLI mosaic data in continental scale, and investigated its characteristics and possibility for the land cover investigation. The study area of the Central Asia including the western part of China to Caspian Sea spreads over the middle latitude zone from 54E to 95E of longitude and from 31N to 50N of latitude, approximately 4,200 Ğq east and west and 2,100 Ğq south to north. The rapid changes have been taken place in the snow and glacier area over the mountains, the closed lakes and their vicinities in the area during the past about 50 years.

Fifteen scenes of GLI level 1B data of summer in 2003 were converted to a coordinates system of Lambert's conformal conic projection with about 250m ground resolution. A geometric correction method composing of two processing stages by the satellite positional data based on orbit parameters and ground control points was considered for the precise orientation. A GLI mosaic image covering the study area was created from the geometrical corrected scenes through cloud removal process. The mosaic image covering the wide rage area showed the detailed land cover condition such as the mountainous regions covered with snow and glacier, vegetation covered area of forest, grass and irrigated agricultural field, the arid lands and a lot of closed lakes having nothing outflow river clearly. The land cover classification by the maximum likelihood method was applied to the mosaic data. After this analysis, the character-istics and possibility of GLI mosaic data for land cover application were considered with referring to similar ADEOS/OCTS, Terra/MODIS and NOAA/AVHRR mosaic data in the study area. It was shown that GLI mosaic data was available for more detailed land cover investigation due to the higher spatial resolution and the useful channels as well as LANDSAT/TM.