

# **Improving geometrical accuracy of KOMPSAT-1 images over inaccessible area using other satellite image**

**Kim Moon-Gyu**

SaTReC KAIST Korea

Abstract : Many applications of remote sensing data, such as change detection, mapping, and environmental monitoring, rely on the geometrical accuracy of satellite images in use. Precision correction is the process of geometrically aligning images to a reference coordinate system using positional ground truth, namely, GCPs(Ground Control Points). Obtaining GCPs is a very time consuming, laborious and expensive process. The most precise GCPs can be obtained by GPS surveying. However, it is not possible to collect precise GCPs by GPS surveying when the region of interest is inaccessible.

In this research, we propose a cost effective method to improve geometrical accuracy of satellite images over inaccessible area. The geometrical accuracy is enhanced through precision correction with GCPs not collected from GPS surveying but collected from different satellite images.

In this work the target sensor is KOMPSAT-1 EOC. The systematically corrected EOC images achieve geometrical accuracy of a few km. As reference we propose Landsat-7 ETM+ PAN images since the geometrical information of ETM+ is very accurate (~50m). The advantages of using ETM+ as reference are not only high geometrical accuracy but also wide swath of ETM+ so to reduce the number of scenes required over the region of interests. For better accuracy we can use some IKONOS images to improve the geometrical accuracy of the ETM+ images through precision correction. The proposed method can be fully automated through GCP matching and the RANSAC (Random Sample Consensus) algorithm. The proposed method also can be used to reduce the number of GPS surveyed GCPs required dramatically for precision correction of satellite images over large area at the expense of reasonable degradation of the geometrical accuracy.

In this paper we explain the proposed method in detail, and present the result achieved with EOC images.