

## A Study on change analysis of dem generated from airphotos of four decades year ago

Kwang-Hoon Chi<sup>a</sup>, Sung-Soon Lee<sup>a</sup>, Dae-Yong Um<sup>b</sup>, Joon-Mook Kang<sup>b</sup>

<sup>a</sup> National Geoscience Information Center, KIGAM, Daejeon 305-350, Korea, Khchi@kigam.re.kr, : Gisyi@kigam.re.kr, Khchi@kigam.re.kr

<sup>b</sup> Chungnam National University, Korea, Department of Civil Engineering udy5066@empal.com, kang\_jm@hanbat.chungnam.ac.kr

### Commission IV, WG IV/7

**KEY WORDS:** Change Analysis, DEM, Air-photo, Digital Photogrammetry, Abstract Sensor Model, Collinearity equation, Space Resection, Ground Control Point

#### ABSTRACT:

Terrain has been used to model using by DEM generated from stereo images. For DEM extraction using air-photos, it has been need to modeling of sensor that factors to modeling of sensor are generated from camera condition when air-photos are acquired on aircraft.

This study is to analysis of terrain change that is calculated from DEM generated with stereo-air-photos of four decades year ago. Used stereo-air-photos in this study have no camera factors because it lost.

The unknowns of abstract sensor modeling factors are obtained by post-process of images. To decide camera information, it is needed to analyze that exterior orientation factors and focal length factor

which are extracted from images. Since three control points are known as the object point coordinates, we could obtained the six unknown elements of exterior orientation, namely,  $\omega$ ,  $\phi$ ,  $\kappa$ ,  $X$ ,  $Y$ , and  $Z$  using method of space resection by collinearity equation. Fright height is decided from the camera station coordinate that was obtained from exterior orientation elements. For deciding the focal lengths the distance among ground control positions and theirs corresponded distance on photo were measured, then the scale factor was calculate. And focal lengths ere calculated sing scale factor and fright height. The validation of new generated DEM is analyzed a comparison between new generated 3D coordinates and old 3D coordinates of the same locations.