Assessment of Steroplotting Procedure for Small Format Aerial Photographs to Generate DTM Data

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Abstract

On photogrammetry, to generate DTM data from aerial photographs is by doing stereoplotting. There are 2 ways of stereoplotting, automatically and interactively. Interactive method takes a long time for the operator to see and digitize objects in 3D space (three-dimensional) to generate 3D position in ground coordinate system. Principle of automatic stereoplotting is perform stereo matching using cross correlation algorithm. In this method, each stereo pair photos automatically identified the same object, and then calculated its 3D position using space intersection formula. This paper examined application of both stereoplotting techniques, either interactively or automatically, on small format aerial photography (SFAP) to generate DTM data and compared the results between two methods.

In this study utilized 1 block of aerial photo project which consisting of 5 runs, with each run consisting of about 40 photos. After aerial triangulation performed, stereo pairs photos were selected and formed epipolar image. Then, interactive and automatic stereoplotting were applied to each selected stereo pairs photos. Results comparison of both methods were elaborated in this paper.

The results showed that DTM data produced by interactive and automatic stereoplotting were not identical. It can be caused by use of non-metric digital cameras and value of GSD (ground sample distance) below 20 cm, so the variation of appearance of object on the earth will be very diverse, especially in the mixed regions. Both methods have advantages and disadvantages of each. The main advantage of interactive stereoplotting is accurate and reliable DTM data and required almost no editing, while automatic stereoplotting method has high speed processing data to generate DTM data.

Key words: automatic and interactive stereoplooting, non-metric camera, small format aerial photography, parallax, stereo image, epipolar image.