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ON THE EMPIRICAL PERFORMANCE OF THE DMC

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On the empirical performance of the DMC.

On 2004 ICC acquired its first digita l camera, a DMC (Digital Mapping Camera) from Z/I Imagin g, called DMC no. 14. Due to the satisfactory results in the first year of experiences, ICC began the acquisition procedure for a second digital camera.

In November 2005 the DMC no. 26 was delivered and the camera acceptation phase started. The aim is to check whether the performance of the DMC camera fulfi ls the ICC requirements for an aerial photogrammetric camera and whether the camera deliverables improve some aspects of the current film cameras. In this phase a set of some projects with double camera (digital and film) and GPS/INS orie ntation were conducted. This set of data contains a block with a GSD of 8 cm (called Amposta) and a block with a GSD of 50 cm (called Caro). These projects were flown on December 3 rd 2005.

Amposta is a block of 5 parallel strips and 2 transversal strips, taken at a height of 800 m. This block was already flown and aerotriangulated by the ICC in 2000 at a photo scale 1:5000 using an RC30 and B/W film and again in December 2004 using the DMC no. 14. The Amposta block covers an area of 5.3 Km x 5.9 Km and contains 7 ground con trol points distributed 6 at the corners and one in the centre of the block. Additionally one check point in the centre and up to 5 check points of a local geodesic network (set up in 2004) have been identified as check points in the block. GPS/INS data we re used as aerial control in the block aerotriangulation.

Caro block is a block of 5 parallel strips taken over a mountainous area at a height of xxxx m. It covers a small area of a larger block flown with a film camera in 2004. The main feature of this b lock is that one single image has a terrain height difference of approximately 1000 m. The area has been flown on December 3 rd 2005 with the DMC no. 26, an RC30 and a Lidar simultaneously. Moreover, Caro block was flown one more time with the DMC no.14 on December 15 th 2005.

On all these data set evaluation of the DMC camera is performed. In the paper is analysed the res ults of the AT and AAT and the role of the self -calibratrion parameters. Automatic DSM generation from DMC and film sources are compared against a simultaneous Lidar DSM. The wide range of topics analysed includes the effect of the B/H ratio, the lower image noise and the resolution on the manual and automatic point identification or the direct orientation improvement using digital instead film cameras. Finally conclusio ns on the camera performance and remarks on the ICC previous work are drawn.