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Photogrammetric mapping using unmanned aerial vehicle

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Abstract. Nowadays Unmanned Aerial Vehicle (UAV) technology has attracted attention for aerial photogrammetric mapping. The low cost and the feasibility to automatic flight along commanded waypoints can be considered as the main advantages of this technology in photogrammetric applications. Using GNSS/INS technologies the images are taken at the planned position of the exposure station and the exterior orientation parameters (position X_o , Y_o , Z_o and attitude ω , ϕ , χ) of images can be directly determined. However, common UAVs (off-the-shelf) do not replace the traditional aerial platform. Overall, the main shortcomings are related to: difficulties to obtain the authorization to perform the flight in urban and rural areas, platform stability, safety flight, stability of the image block configuration, high number of images and inaccuracies of the direct determination of the exterior orientation parameters of the images. In this paper are shown the obtained results from the project photogrammetric mapping using aerial images from the SIMEPAR UAS system. The PIPER J3 UAV Hydro aircraft was used. It has a micro pilot MP2128g. The system is fully integrated with axis gyros/accelerometers, GPS, pressure altimeter, pressure airspeed sensors. A Sony Cyber-shot DSC-W300 was calibrated and used to get the image block. The flight height was close to 400 m, resulting in GSD near to 0.10 m. The state of the art of the used technology, methodologies and the obtained results are shown and discussed. Finally, the advantages/shortcomings found in the study and main conclusions are presented.

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