



[Volume XXXIX-B3](#)

Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci., XXXIX-B3, 193-198, 2012
www.int-arch-photogramm-remote-sens-spatial-inf-sci.net/XXXIX-B3/193/2012/
doi: 10.5194/isprsarchives-XXXIX-B3-193-2012
© Author(s) 2012. This work is distributed
under the Creative Commons Attribution 3.0 License.

ADVANCES OF FLASH LIDAR DEVELOPMENT ONBOARD UAV

G. Zhou, J. Yang, X. Li, and X. Yang
Guangxi Key Laboratory for Spatial Information and Geomatics, Guilin University of Technology, Guilin, 541004, China

Keywords: UAV, LiDAR, flash, data acquisition, 3D imagery

Abstract. A small cost-low civilian UAV (Unmanned Aerial Vehicle - UAV) platform usually requests that all carried components should be light in weight, small in volume, and efficient in energy. This paper presents the advance of a pre-mature of flash LiDAR system including laser emitting system, associate with the pulsed voltage technology. A complete laser emitting system, including laser diode, conic lens, alignment, divergence angle, etc., has been designed and implemented. The laser emitting system is first simulated and tested using 3D-Tool software, and then manufactured by an industrial company. In addition, a novel power supply topology based on two coupled coils, pulse generator circuit, and a fast switch, is proposed since several 100 V in voltage, 10-100 A in current, several hundred millisecond in pulse width is needed for flash LiDAR system onboard a small low-cost civilian UAV platform, and the traditional power supply had problems in efficiency and bulk. Finally, laser emitting and the power supply are assembled and tested. The size of laser footprint is 4398.031 mm x 4398.031 mm in x and y axes, respectively, when shifting from a flight height of 300 m, which is close to the theoretic size of 4.5 m x 4.5 m. The difference of 102 mm can meet the requirement of flash LiDAR data collection at a flight height of 300 m. Future work on extensive and on-going investigation and investments for a prototype of flash LiDAR system is drawn up as well.

[Conference Paper](#) (PDF, 550 KB)

Citation: Zhou, G., Yang, J., Li, X., and Yang, X.: ADVANCES OF FLASH LIDAR DEVELOPMENT ONBOARD UAV, Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci., XXXIX-B3, 193-198, doi:10.5194/isprsarchives-XXXIX-B3-193-2012, 2012.

[Bibtex](#) [EndNote](#) [Reference Manager](#) [XML](#)

