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State of the art of LiDAR technology and application to precise measurements of geographical features

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Airborne LiDAR technology is rapidly widespread in recent years. It is able to measure the geographical features in the forest region accurately by using LiDAR, though it is very hard to measure there by airborne photometry. And such a precise result of measurement is effective for the grasp of the situation of the occurrence of sediment disasters, the hazard anticipation of them, and the research of the topography of active fault.
The development of GPS/IMU that precisely measures the position and the orientation of the aircraft greatly contributed to the development of the LiDAR technology. And the performances of the LiDAR machines have improved greatly, too. For example, frequency of the laser pulse has increased very much. In addition, it became able to measure very detailed geographical features by the method to record the entire reflection wave in recent years and installing it in the helicopter. By using heli-borne LiDAR method, it was verified to obtain the terrestrial measurement accuracy of 1/500 corresponding.
In this report, we introduce the current state of airborne LiDAR technology and some examples of the measurement results.

Keywords: airborne, LiDAR, helicopter, reflection wave