Geophysical Research Abstracts,
Vol. 11, EGU2009-10746-1, 2009
EGU General Assembly 2009

UAV-based remote sensing of the mudslide Super-Sauze, South France

U. Niethammer, S. Rothmund, and M. Joswig
Institut for Geophysics, Universität Stuttgart, Germany (uwe.niethammer@geophys.uni-stuttgart.de)

Remote sensing information of landslides acquired by conventional airborne and spaceborne sensor systems is available for a few decades. However, due to the high costs to this methods and the limited spatial and temporal resolution scientists are beginning to turn to unpiloted aerial vehicles (UAVs) as a low-cost alternative. In 2007 we started the comprehensive research of UAV-based remote sensing especially for monitoring landslides. Our research focused on the development of a reliable low-cost UAV solution and on the image processing chain generating ortho-mosaics.

The Super-Sauze landslide is located on the North-facing slope of the Barcelonnette Basin (Southern French Alps). It has developed in a torrential basin located in the upper part of Sauze torrent, on the left side of the Ubaye valley. This landslide is one of the persistently active landslides (since the 1970's). It extends over a horizontal distance of 850 m and occurs between an elevation of 2105 m at the crown and 1740 m at the toe with an average of 25° slope. Its total volume is estimated to be 750.000 cubic meters and velocities range from 0.01 m up to 0.4 m per day.

In this study we will show the potential of UAV-based remote sensing for analysis of morphometric, hydrologic and fracture processes behaviour (Walter & Joswig, EGU 2009) of the studied landslide. In October 2008 a UAV-based remote sensing campaign of the Super-Sauze mudslide has been carried out. During this campaign a series UAV-borne photographs of the Super-Sauze mudslide has been acquired. The covered area was in the range of 850 m x 250 m. The acquired photographs have been combined to an ortho-mosaic. The achievable ground cell resolution was in the range between 3 cm to 8 cm. A comparison between the achieved ortho-mosaic and an airborne ortho-mosaic from May 2007 has been carried out. In this period displacements, varying between 2.7 m and 55.4 m have been detected and different structures, indicating variable deformation and sedimentation processes at the surface of the slope have been identified.