



EGUsphere, community comment CC1  
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## Comment on egusphere-2022-156

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Community comment on "Brief communication: An autonomous UAV for catchment-wide monitoring of a debris flow torrent" by Fabian Walter et al., EGUsphere,  
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In this 'brief communication', Walter et al. introduce a new technique for (semi-)autonomous high-resolution monitoring of sediment dynamics in remote alpine terrain based on UAV remote sensing and photogrammetry. The presented system consists of a hexacopter and a base station that facilitates automatic recharging and acts as an operational relay between the UAV and a remote operator, who is in charge of the flight monitoring. From a technical and operational point of view, a remote operator would not be necessary within this framework, but supervision by a human is still mandatory for (autonomous) UAV missions beyond visual line of sight. The feasibility of the approach has been successfully demonstrated at the Illgraben debris-flow catchment in Switzerland and paves the way for (semi-)autonomous UAV-based monitoring in other contexts and terrains.

In addition to the comments of Reviewer 1, I have some (rather technical) remarks and questions that might be of interest for some readers:

- 1) A limited durability and replacement of some system components is mentioned in the text (L93-94). Which components were less reliable or failing and how often had the base station to be serviced during the summer months? The maintenance aspect would be especially important for autonomous operations in even more remote locations where the frequent replacement of components is difficult.
- 2) Had the remote operator/observer in the control centre in St. Gallen ever to intervene during the three-year period? Has the remote operator/observer full control over the UAV and what would happen in the case of an (unlikely) emergency (e.g. bird attack or curious people/animals approaching the base station during the survey or landing process)? I assume the base station is fenced. Is this correct?
- 3) Can you say anything about the precise and autonomous landing of the copter: is the RTK GNSS in combination with a vision-based tracking system used for this purpose?
- 4) Does the base station rely on an external power supply or is it connected to solar panels and a power station (not shown in Fig. 1)?
- 5) I'm aware that the selected manuscript type has a strict page limit, but I am missing a

brief discussion on similar approaches/applications (i.e. semi-autonomous UAV monitoring) in the geosciences.

Wording: Unoccupied Aerial Vehicle is increasingly used in the (geo)scientific community as a more neutral term for UAV (Joyce et al., 2021:

<https://doi.org/10.3390/drones5010021>) and I therefore suggest to adopt it.