

Geosci. Instrum. Method. Data Syst. Discuss., referee comment RC2  
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## Comment on gi-2022-3

Anonymous Referee #2

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Referee comment on "MOLISENS: a modular MOBILE LIDAR SENSOR SYSTEM to exploit the potential of automotive lidar for geoscientific applications" by Thomas Goelles et al., Geosci. Instrum. Method. Data Syst. Discuss., <https://doi.org/10.5194/gi-2022-3-RC2>, 2022

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This is an interesting paper presenting a methodology for developing an automotive lidar unit for use as a mobile lidar unit with geoscience applications. The manuscript does a nice job of explaining the components of the system and the testing that was done to find the applicable range and resolution. Perhaps the one component that I feel the paper is missing is a comparison of a point cloud results from the two test areas with a point cloud generated from the Riegl scanner used for the initial testing. The authors do highlight why this would be impractical for the entire area at the Lurgrotte Semriach, but even a small section would provide useful evidence for how comparable the mobile unit is to a more well-known tripod-based unit in a complex natural setting.

Line 24: remove "allows to build" and replace with "builds"

Line 33: Three systems are mentioned (Lidar, Radar, and Camera) so remove the word "both"

Line 87: I may be misunderstanding something, but here you note that the system can be powered by AC/DC adapter, but in line 91 you note that it requires external batteries to be mobile. If the appeal of this system is that it is mobile doesn't that exclude the AC/DC power option.

Table 1: I know the previous reviewer mentioned removing this table, and while I agree it may not be necessary, I do appreciate knowing the size and weight of the unit, it is much lighter than many others available, and this certainly increases the number of potential users.

Line 94: please consider writing out your acronyms, in particular IMU. It was easy enough to find what this was, but for those of us not familiar with these acronyms, writing them out can be helpful for clarifying their purpose.

Line 100: It appears that HAT is typically a capitalized acronym. Also, this could again be written out once to help clarify what it is.

Line 217: here it is noted that the sensor records point cloud information, yet earlier in line 173 you noted that the lidar doesn't produce the point cloud, but rather the raw data are timestamp, measurement ID, and range. I suspect these are discussing two separate steps, but there is some additional information may help clarify, as both lines appear to be discussing the Lidar sensor.

Line 289: I am curious about the errors in ice. Perhaps these errors are well covered in the literature and there can be citations, but if not, maybe there can be a few more details. I would imagine that because light can move through ice it might create some errors in the data. Perhaps this is accounted for in the lower return intensity described later, but it might be helpful to address outright how the MOLISENS system compares to others when surveying ice.

Line 294: There appears to be a few words missing after "These are the price, size, weight, and robustness...", or perhaps there should be a semicolon connecting this with the previous sentence.

Line 324: "A useful" not "an useful"

Line 329: These sentences seem to imply that the lower intensity returns for ice surfaces may be better for change detection. If this is true, could you provide more information as to why. If this isn't meant to be implied, consider removing the word "hence", and possibly moving this line.

Line 335: Does this line suggest that Structure from Motion (SfM) would be a preferred method of monitoring coastal bluffs? This is the first mention of SfM, it might be helpful to have a line or two about the advantages of this system in comparison that one, particularly where you might have good GPS control.

Line 336-339: This sounds amazing, I look forward to this technology becoming more widely accessible.

As a general comment about the discussion and conclusions, river systems are mentioned a few times as an application for this technology, but I suspect the laser isn't powerful enough to penetrate through water. Similarly, there is no mention of multiple returns, so I suspect this isn't penetrating through vegetation. It may be worth noting these caveats specifically depending on the anticipated audience.