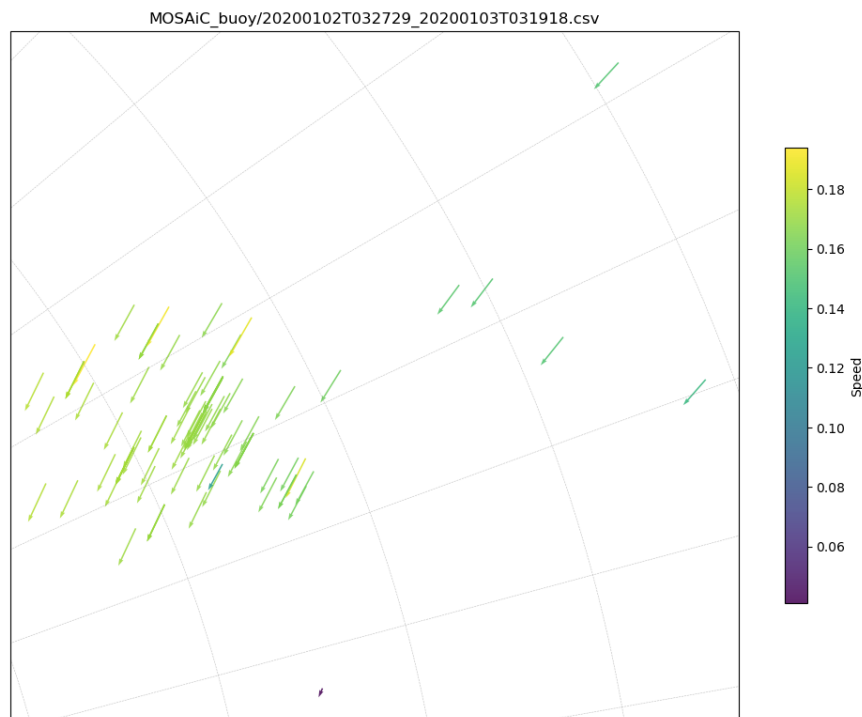


The manuscript "Community Challenge for Image-Derived Observation of Sea Ice Drift and Deformation" presents a dataset to validate sea-ice drift algorithms. The dataset includes L1-GRD and pre-processed Sentinel-1 SAR images, along with sea-ice drift vectors derived from ice-drifting buoy trajectories from two recent experiments: MOSAiC and SIDEx. A common validation metric is suggested.

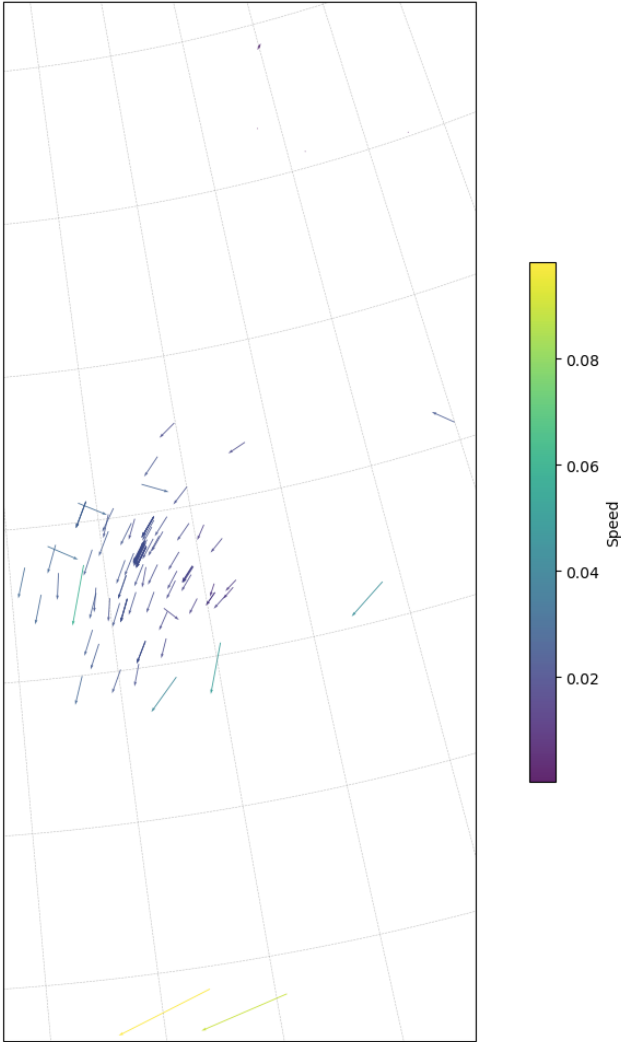
The manuscript does not study a geophysical phenomenon or describe a new method; it contains no original scientific results. I cannot recommend it for publication in The Cryosphere; instead, after a major revision, it should be submitted to a dataset-presentation journal, for example, Copernicus Earth System Science Data (ESSD).

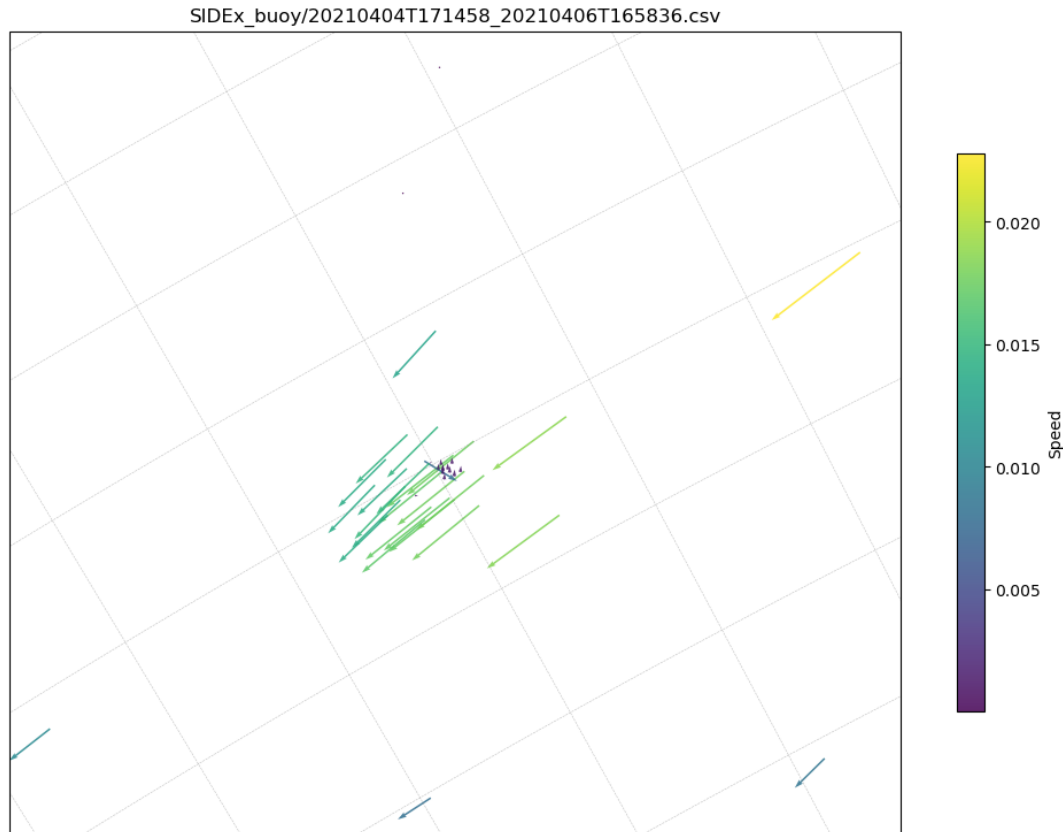
Major comment

1. The buoy dataset is full of rogue vectors. See just a few examples below.



MOSAiC_buoy/20200606T073533_20200608T071858.csv





The dataset must be quality-controlled before publishing. If that's the goal of the manuscript, it is actually quite important to have accurate reference data for validation.

2. The manuscript contains a lot of references to sea ice drift and deformation algorithms and datasets, but they are scattered around the manuscript incoherently. For example, on lines 48 - 49, there are some references to SID algorithms and on lines 123-124 there are references to other algorithms, and then on lines 135 - 161 there are even more algorithms with partial overlap. Please make a single separate section where you very briefly overview all existing algorithms. Otherwise, it is unclear why some algorithms are mentioned there and not here.

3. How are buoy positions interpolated to match the S1 acquisition time? Is it linear interpolation or nearest neighbour? And why? What are the thresholds for excluding buoy records that are too early/late relative to S1 acquisition? This is critical for the accuracy of the dataset. As it is written on lines 515 - 530, the nearest SID vector should be selected in space. Maybe the nearest buoy records should also be used instead of interpolation?

General comments

1. Check consistency of references in the text. E.g., Howell is referred to as Howell or S. Howell or S.E.L. Howell; and Korosov is referred to as A. Korosov or A. A. Korosov.
2. Add notation of variables that you use in formulas the first time they are mentioned in text. E.g., Line 231: "All displacement (d) and bearing (θ) calculations ...". Also make sure that all variables in the equations have explanations in the text.

Minor comments

Line 43.

Computing deformation over **short** timescales matters more for understanding sea ice rheology, as intermittency plays a larger role here.

Line 49.

If you prefer to mention only the most recent algorithms here, I would recommend adding the following reference:

Chua, S. M. T., Korosov, A., & Ólason, E. (2026). LiMOSAT: a system for deriving Lagrangian sea-ice motion from satellite data. *International Journal of Remote Sensing*, 1–24.
<https://doi.org/10.1080/01431161.2026.2709704>

Line 58.

What about (Howel et al., 2022)? It is a basin-wide SAR-derived ice drift.

In addition to the reference in the previous comment, I want to draw your attention to the conference presentation:

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=6504082

The dataset is being prepared for publication and will be available online soon.

Line 68.

Please rephrase 'method error analysis'

Line 122

Please remove the reference to Bouillon & Rampal, 2015a. They do not propose an algorithm to derive sea ice drift from remote sensing data; instead, they improve the computation of sea ice deformation from RGPS data.

Line 147

Should be (Korosov and Rampal, 2018)

Line 159

It is worth adding a reference to (Rampal et al., 2019)

Line 166

Should be (Korosov et al., 2023)

Line 267.

How is the interpolation performed? See major comment 3.

Lines 275 - 280.

What is the rotation of the ice floes? Is your dataset representative for testing the SID algorithm's capability to derive sea ice rotation?

Line 309.

How is the interpolation performed? See major comment 3.

Figure 4.

What about thermal noise removal? The cross-pol channel is known for high thermal noise, which impedes sea ice drift retrieval near the swath boundary. Is it performed? If not, why?

Lines 445 - 455

What is the rotation of the ice floes? Is your dataset representative for testing the SID algorithm's capability to derive sea ice rotation?

Line 476

Please add notation for magnitude and angle.

Line 494

"Linear kinematic feature" is the commonly used term.

Line 556.

Should d_b and d_a be v_a and v_b as in Eq. 8? The slash can be replaced with a comma.

Eqs. 12 and 13.

Why are other commonly used metrics for continuous measurements, such as bias and R2, not suggested here?