The paper presents a study that combines two well stablished dune mobility indexes to create a new one (TsoLa), and relates this to dune mobility in Patagonia. The paper is well written and addresses the predictability of dune mobility which is an important research gap, particularly in face of climate change.

In my view it remains unclear what limitations of the existing Tsoar and Lancaster indices this new formulation is intended to address, and what additional insight it provides beyond these established approaches. Tsoar and Lancaster's indexes are based on similar parameters included in the model proposed here. A more explicit justification is needed, ideally supported by a direct comparison between the existing indices and the proposed one, to demonstrate whether and how the new index improves the assessment of dune mobility.

The idea is that this combination reinforces the characteristic of mobile dunes, counting them as active when both indices indicate they are active. Besides, the statistical model performs quite well with this combination. A better explanation will be provided in the manuscript.

A few other specific comments:

Figure 1 – the wind roses suggest that NW and S/SW winds are dominant, but the RDD indicates net dune migration towards the E. There seems to be a lack of W in the wind roses to reflect an easterly net direction of dune migration. A legend showing which speed classes are represented by the colours could be useful here.

In this case the automatic draw of the net dune migration on the wind roses may be incorrect. The lack of NE winds may influence this. It Will be checked.

Table 1 – did the authors consider veg and non veg parts in the calculation of the dunefield dimensions?

Yes, it will be addressed in the caption.

Line 316 – Only 30% of the winds exceeded the threshold, but Figure 5 seems to suggest that winds above ~6m/s are quite frequent in the record. This needs clarification, or perhaps change the colours in the wind roses as changes in shades of blue are too subtle and hard to see. More information about the wind data would be helpful – e.g. was the met station data provided classified in any way?

It is correct. The legend is not appropriate because this figure only represents winds above ~6 m/s, therefore, there are no measurements from the three lower wind speed classes. Clarifying this in the text and changing the colors will improve this.

Figure 6 – The very high values in the early 1990s seem a bit inconsistent with the rest of the record. Sometimes older datasets can have quality or methodological issues, have the authors checked whether these values are real, or could they be artefacts? A bit more detail on data quality and consistency over time would help here.

We noted this, but so far, we only have the "raw" records. We will try to get more information regarding this.

Figure 8 – The meaning of this figure is a bit unclear, could the authors clarify what the axes represent? A more intuitive explanation in the caption or text would really help the reader.

Similarly, Figures 9 and 10 need clearer legends, as it is currently difficult to interpret what is being shown

More detailed information/captions for Figures 8-10 will be provided.

Line 454 – DPs are only a function of wind and grain size, they do not reflect longer daylight hours etc.

Correct. It is only directly attached to stronger winds.

Line 429 – the authors claim that there is a progressive greening of the landscape associated with a decline in dune migration rates, but no data is offered to verify this.

It can be removed or referred to the previous work done in the same area (Toffani et al., 2024).

Line 489 – could the authors clarify how the index was able to particularly identify stable dune conditions if the dunefields have been active/migrating over the years? Figure 11 suggests that the dunefields have been migrating over time, although at decreasing rates. It's not really clear what extra insight the new index is adding here—would we see a similar pattern just using RDPs? Could the index be used to predict what will happen in the long term, e.g. with changes in the SAM? After reading the introduction, I thought that was the direction that the paper was going to take. Similarly, a more complete discussion about the applicability of this index in other areas of the world would be useful as this was one of the study's objectives.

The new index and model aim to predict whether dunes will or will not migrate under certain climatic parameters. For example, with more than 100 mm of rainfall during a certain time period, it is most likely that dunes will not migrate.

Dos the TsoLa index define a threshold above which dunes become mobile (such as in Fig 7)? And does it have similar limitations to existing indices (e.g. only working when rainfall is above ~50 mm)

To elaborate the model, we considered mobile dunes when both indices (Tsoar and Lancaster) indicate they were active. According to the model, a new threshold can be defined based on temperature, precipitation, and the SAM value. The limitations are similar to the existing indices.

Table 3 - legend must include that dunefield migration are rates in m/year. What are "Dune 1 to 5" and "Dune 1 to 6"?

The unit will be added and "Dune 1 to 5" and "Dune 1 to 6" are the different dune fronts measured to estimate dune migration that are shown in Fig 11.

Thank you for your feedback, Graziela. The comments were really helpful.