The issue of using short-term measurements of aeolian sand transport rate on the beach to estimate the annual potential transport and then compare it with the actual sediment budget of coastal dunes is still one of the biggest challenge. This issue has been addressed by many researchers for a long time, but probably much research is still needed to reach any consensus. Therefore the submitted manuscript fits very well into this research trend. The objectives of the paper (listed in lines 124-129) are clearly stated but they are so extensive that each of them could be a separate research task. If we do not treat them properly, the results obtained will be random and will not expand our knowledge. I appreciate the authors' intentions, but they probably did not realize the complexity of the issue.

I have many comments and remarks to the manuscript, which make me not recommend it for publication as it is now.

Comment 1: STUDY SITES lacks description of different beach segments of Spiekeroog (why was the island divided into 3 sections?), METHODS and experiment procedure are described superficially. CONCLUSIONS are not supported with data. The manuscript is written chaotically. For example, Section 3 (Results) and subsection 3.2 - First, wind profiles are described, then sand transport, and eventually the conditions in which the sand transport intensity was measured (but they are probably attributed to the speed data from the weather station located somewhere, not from authors' measurements made at the study site). Wind direction, which is very important factor when it comes to determining the available fetch distance and airflow forcing and steering is described at the end of this section. .

Comment 2: Sand transport rate was measured by BESTs traps and only at one site the vertical distribution of mass flux was described by an exponential decay function. At other sites, however, the vertical distribution of mass flux was not known (??, line 212) and the authors used linear interpolation of point data. There are many functions used to describe the vertical distributions of aeolian mass flux (as exponential, logarithmic, power, and – on rough surfaces – Gaussian or a combination of different functions), but no one uses a linear function. If the authors use such a trend, they should justify it. Which entitles them to calculate the total transport intensity based on such a trend? Further on (lines 295-299), the total sand transport is calculated on the basis of a linear trend, but it is additionally cut off close to the ground where in fact the sand transport rate is the highest, provided it is not within a vegetation. I do not understand this idea. Additionally, the annual potential sand transport was calculated from Van Rijen and Strypsteen (2020) model, using the data from nearby (?) weather station and assuming a priori that it reflects given conditions and studied beach-dune system well. Its outcome was verified by a comparison with the result of a single measurement of the sand transport rate (lines 300-304).

Comment 3: The measurements of sand transport rate were made during four days at relatively low wind speed (looking at Fig. 5 it was probably less than 6 m/s at 1 m height, site on the beach), so the sand transport must have been relatively weak and probably intermittent. One of the measurements was carried out throughout the night (lines 289-290), so if the BEST trap did not fill up with sand for such a long time, the transport must have occurred occasionally. Some of the measurements were accompanied by rain which probably suppressed such a weak transport to zero. The maximum sand transport rate was 300 g/m/h (Fig. 6) – it means 3 g of sand per 1 cm of beach during 1 hour. My conclusion is that the data set collected by the author does not represent sand transport conditions on the beach and cannot be used as a basis for any further calculations or model testing. And in fact they are not used further on.

Comment 4: The authors compare the annual sand transport rate calculated on the basis of a model developed by Van Rijen (2018) and Van Rijen and Strypsteen (2020) with transport rate derived

(how?) from the geodetic data (volume changes of beach and dune), but in Chapter 4.2 we got to know that the beach and dune was nourished with sand!!

In fact, the measurement of sand transport rate presented in the manuscript are of low value, but they are unnecessary for the rest of the paper. Therefore I suggest to remove this part and better organize the article.

Summing up, the submitted manuscript needs major revision and should be review again.

Some more remarks and comments:

Lines 80-81 “the available fetch length between the tidal high water line and the dune foot, usually in the form of a beach”? Can it be anything other than a beach?

Line 95 – ebda?

Line 97 – not to “to lateral upwind canopy coverage percentages” but to density of vegetation.

Lines 98-99 – ranges of vegetation density – cite the source of this data

Line 148 – What do you mean by “primary dune row”? A foredune?

Lines 158-159 – the first sentence is unnecessary

Lines 171-174 – it is not clear. You used only BEST traps, didn’t you?

Line 187 – you should provide at least an approximate grass density and height as depending on it sand transport is different

Line 191 – “In total, six data sampling intervals lasting each half a day were logged”. You used BEST traps – did they operate for half a day?

Table 1 – are these values averages calculated for wind event during experiments? What was the actual wind speed at any elevation and what was its variability during the measurements?

Line 212 – you did the research, not Williams (1964)

Equation 4 – there is no explanation of all symbols used in the equation: Q_D, α_D, $u_{*,th}$ Some of them are explained further in the text, but it is too far

Line 221 – median, not medium. How did you determine the critical fetch distance?

Line 229 – incipient velocity?

Line 234 – replace solid with grain or particle

Line 238 – what do you mean by “nearby weather station” Explain in the section on Study site.

Line 248 – air humidity

Line 284 – what is front crest?

Fig5 – use the same unit for q and Q (either grams or kilograms) here and throughout the text

Line 300 – do these wind data come from your measurements or from the weather station which is far from your study site?

Line 335 – explain α_{dir} and α_W

Line 345-350 and Table 2 – you provided calculated sand transport rate for 3 beach sections, but they are not described in the study site. Why is Spiekeroog divided into 3 segments, what are the differences between them?

Table 2 – how did you calculate annual sand transport rate on the basis of geodetic data? You can calculate volume changes, but how did you transform it into the transport rate. Did you assume any sand bulk density? Provide it. There is not any explanations in METHODS.

Lines 393-395 – “For no clear reasons, the AT2 did not measure any significant transport”. This site was at the base of a dune, were the airflow decelerates due to an increase in the pressure gradient (during onshore or oblique onshore winds). Analyse the data on wind direction! I can only guess that it was alongshore or oblique onshore (Figure 6). Additionally, the wind during the measurements was very weak, it's no wonder that sand was not transported there. Whether the sand transport will occur here or not depends on both the wind force and direction.

Conclusions – this section repeats what has been done (lines 430-440), and further on there is a kind of a discussion with literature (lines 442-459). In fact these are not conclusions. In lines 459-460 the authors stated that dunes grow that independently of their nourishment but I do not any information on the magnitude of the nourishment and therefore I do not know how the authors came to this conclusion.