General comment by authors:

We appreciate the generally positive and encouraging feedback from the three reviewers. We also acknowledge the reviewer comments which led to improvements of the manuscript.

Below, the reviewer's comments are recalled in black, our response is given in blue, and changes to the manuscript are given green.

Anonymous Referee #3
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The presented paper uses a 25 year data set of cloud base height measured with three different ceilometers (three different periods). The authors present a description of a case about a small cyclonic system based on CBH data and also longwave irradiance and temperature data. They also add ceilometer data in order to understand better the data provided by a cloud radar. Finally, a statistical analysis about the percentage of cloudy sky is discussed and also the time series of the CBH median, indicating that results could not be representative since the inhomogeneities in the time series caused by the changes on the instrument. In general this work fits with the scope of the journal and I consider it must be accepted after some minor revisions.

- Abstract: The abstract should not be equal to the introduction section, it should describe a little more what authors will do in the full paper.

> We have added a describing sentence to the abstract.
>
> >> page 1, lines 12 pp.
> **We explain the composition of the three sub-periods with different instrumentation contributing to the data set, and show examples of potential application areas.**

- The objective of the paper is not clear in the text.

> As any interpretation of data is out of the scope of ESSD, the article is intended as description pertaining to a data collection. By providing examples on potential application areas, we further underline the usefullness of the presented data set. We also discuss the quality of the data and point out their limitations. We have added an according statement to the Introduction:
>
> >> page 2, lines 12-13
> Here, we present a 25-year ceilometer cloud base height dataset from Ny-Ålesund, Svalbard, indicate the potential application areas **by providing several examples, and point out limitations of the data set with regard to trend analysis.**

- Figure 1 does not provide any significant information, it could be removed.

> Since the photo gives an impression of the environmental setting of the instrument and was appreciated by the other reviewers, we prefer to keep this figure.

- P4L6: This sentence should be in the introduction but not in this section.

The sentence has been removed from section 3.2.

>> **3.2 Cloud Base Height as Auxiliary for In-Situ and Remote Sensing Cloud Measurements**
To approach the comprehensive characterization of macro- and micrpophysical cloud parameters in Ny-Ålesund, a 94 GHz frequency modulated continuous wave cloud radar (Küchler et al., 2017) has been installed…

- P4L7: The description of cloud radar fits better in the data section "data".

Since the topic of this data paper is the ceilometer data set, we focus on the according ceilometer data description in the 'data section'. Section 3.2. should only provide an example for an application of the ceilometer data set. In this context, the description of the cloud radar data is of minor importance in terms of instrumental aspects, but the description is relevant to explain the necessity of simultaneous ceilometer measurements under certain atmospheric conditions. Therefore, we prefer to keep all cloud radar issues concentrated in one section.

- P5L18: The median of CBH trends should be quantified by Theil-Sen estimator or others, even homogeneity test could be done in order to stablish the inhomogeneities of the time series. In addition, the time series and trends of the percentage of cloudy sky should add more value to the paper.

- P5L28: but a homogeneity analysis could be done, or at least study the trends in the period of each ceilometer.

Since the presented 25-year data set is actually a combination of data retrieved from 3 different instruments with different technical limitations and different retrieving algorithms, homogeneity is not given due to physical reasons. A homogeneity analysis therefor seems redundant.

As the longest duration measured continuously with one instrument is 13 years, the time period for trend calculation is too short to retrieve any significant trend. This is a major issue we wanted to point out in our manuscript. As apparently it was not yet expressed in a sufficient manner, we added the following sentences:

>> Page 5, lines 30 pp.
As there is no absolute reference, we consider the CBH in the presented ceilometer data set a best estimate for each respective sub-period. Constraints though are given for the calculation of long-term trends: in this respect, the data should be treated as three incoherent datasets, each of them generally too short to retrieve significant trend information.

- P5L31-32: The results of this work do generally not prove that.

We changed "prove" to "provide".

>> Furthermore, the ceilometer data **provide** necessary auxiliary information for the retrieval of cloud parameters from the cloud radar.

- Figure 4: A legend could help to understand the bars.

Figure 4a already contained a legend. We have now added a similar legend to Figure 4b.