Technical comments

There is a large number of figures and unfortunately not always placed close by the text where it is mentioned. This makes it sometimes a bit difficult to follow numbers and patterns described in the text.

Please, decide on one spelling of sea ice/ sea-ice. Mainly sea ice is used, although sea-ice is written in some lines: 14, 24, 218, 269, 289 and 395.

Line 20: An abbreviation (CDOM) is used before clearly defined. I recommend to not use abbreviations in the abstract.

Line 25: Can you please explain/ describe the pathway of dense water outflow in more details in order to reach Fram Strait? See comment below (line 65 – 67).

Line 24 - 26: It would be easier to read and understand if you write two sentences here: "Lastly, … into Fram Strait. It was found … matter likely caused by …"

Line 30: Is it Spitsbergen or Svalbard? In Line 67 your write Svalbard and not Spitsbergen.

Line 31+227: winter sea ice formation/ production

Line 50: "sparse nature" it is clear what is meant here, nevertheless, it is an uncommon wording. Is there any other possibility to make clear that field observations are rare?

Line 55: e.g. instead of eg. (two times in this line)

Line 64: distinct instead of distinctly

Line 65 – 67: From description it is hard to understand how circulation happens here. It would be helpful for understanding water mass sources for Storfjorden, if a map would be available with currents, entering/leaving path ways, Storfjorden polynya and water mass origins as well as outflows especially dense bottom water. Please add a reference for water mass definitions and currents.

Line 79: wrong citation type, brackets are wrongly placed: (see e.g. Bensi et al. (2019))

Line 104: It would be more precise if you write "In situ measurements and sampling procedure"

Line 116 + 147: Please be consistent: I recommend to put listing (i, ii, iii) italic

Line 117: Although Mili-Q is a common word when working in the laboratory.It is recommend to use the word ultra-pure water within a publication.

Line 120: Do you have any solution how to avoid variability in blanks during cruise to create blanks under the same conditions as samples are taken?

Line 136 – 139: Do you obtain water samples with the rosette separately to the IOPs or within the same cast? It seems to be a separate cast, please, make this clearer in the paragraph about water sampling (Line 136 – 139). What about depth/pressure information?

Line 148: Be careful to keep the minus at the related number together and place a space between number and unit (-80 °C) and (Line 186) be careful and keep unit together m^{-1}

Line 152: "…, close carefully and sealed the caps with parafilm."

Line 164: Can you please specify which three spectra are averaged?

Line 202: Can you please shortly explain "6S radiative transfer model"?

Line 210: You came up with an abbreviation not explained before: chl-a

Line 213, 219, 231, 242, 273, 321: Please, be consistent: decide for one description of the transect from north to south: upper- or lower-case letter and also the direction (north-south/ south-north)

Line 217: You came up with an abbreviation WSC, it is explained on paragraph later.

Line 219: Which station are meant with "middle of the fjord"?

Line 220: The northern stations where mentioned, if you have numbers in the figures, you can easier reference to this and it is easier to follow while reading the text.

Line 227-229: You are repeating in different words the sentence of line 217 – 219. Is it possible to combine these two sentences?

Line 261-262: Can you please give clear numbers for lowest attenuation and scattering?

Line 267-269: Please refer in line 267-269 again to the corresponding figure.

Line 278 + 289: Please add to Figure 7 which panel it meant.

Line 285: Please add related figure for $a_{CDOM}(440)$ data

Line 286+287: Brackets after citation are missing.

Line 293: Miss-spelling: "observations east of Storfjorden"

Line 305, 314, 322, 330: Stick to one type of referring to figure panels (top, middle, bottom or a, b, c).

Line 307: Can you please specify stations numbers to give an easy and quick possibility to find mentioned maximum in the figure?

Line 311: Please describe distribution/situation with a few words before referring that it looks like in the WSC.

Line 313: chl-a: except of Line 210 always phytoplankton is used. If only chlorophyll is meant that please write the full word or give explanation of abbreviation chl-a beforehand.

Line 320: Can you please indicate at which figure I can see the mentioned increase, since it is not in figure 9 which was just mentioned before.

Line 327: Brackets for citation are wrong.

Line 330: Formatting of aLH(676) is different than in the first paragraph of section 3.5.

Line 355-361: Can you give any error estimation for water-sample based values? I guess, 3 samples are not much to define significance.

Line 364-366, 371, 372, 374: Please place a space between number and unit.

Line 370: Abbreviations were already introduced for Atlantic Water (AW) and West Spitsbergen Current (WSC) so please use them.

Line 372: "However, …"

Table 2: Can you please explain what bold numbers mean within the table?

Figure 1: Please put grid below location numbers to not cover numbers.

Figure 3-8: It would be useful to have station numbers within the plots. Then it would be easier to mention station numbers within the text (see comment to Line 220).

Figure 3: It is a bit confusing presenting CTD-data and do not explain which cast/instrument set up was used to obtain presented data. It seems that you present data from the instrument package where station 511 was not sampled due to battery failure (offline measurements). Isn't it possible and better to use CTD-data from the casts made with the online CTD, when also delta 18oxygen samples where performed? Otherwise please explain why you used data with station gap instead of "full" data sets. Averaging in Ocean data view would be more precise with more stations.

Figure 4: What about combining figure 4 with figure 3. This would reduce number of figures and all parameters described in paragraph 3.1 are at one view.

Figure 5, left: Is there a legend available? In the caption: Can you please make sure that numbers and corresponding units stays together (Line 247) and additionally please add by which symbol sampling stations are indicated (green dots).

Figure 7: I suggest to add density lines to figure 7a instead of figure 6a or to both, if required. For me it seems that in figure 6 it is not used for explaining pattern within the text belonging to figure 6. For figure 7 you describe a clear pattern related to density pattern.

Figure 7+8: Please shrink figures to fit the page, so that caption fits to the same page.

Figure 8b: You use DIVA gridding for a_phy(440). Did you use the same for all other panels? I do not recommend using DIVA gridding, since it can create artificial pattern which might not exists. This makes it dangerous to interpret pattern. Please comment your decision of DIVA-gridding. In the caption it is written that density anomaly lines are presented, actually they are not visible. Please describe white points within the caption.

Figure 11: Colours are very hard to distinguish, please choose as second colour that stands out more.