

**2nd round revision of the manuscript submitted to ESD by Luis Gimeno-Sotelo, Raquel Nieto, Marta Vázquez, Luis Gimeno**

I thank the authors for addressing my previous major comments. The revised article text better explains the results and I recommend it for publication after taking into account some minor comments below.

**Title:**

Thank you for changing the title - however, I find the new title "*The pattern of long-term changes in the moisture transport for precipitation with Arctic sea ice melting*" still confusing. My suggestion would be something like this: "A new pattern of the moisture transport for precipitation related to the Arctic sea ice extent drastic decline" to better highlight the importance of the results in connection to the 2003 sea ice extent decline. But if the Editor agrees with the current title - I leave this to the authors to decide if they want to modify it.

**Abstract:**

1st sentence "In this study we use the term moisture transport for precipitation (MTP) for a target region as the moisture coming to this region from its major moisture sources that then results in precipitation over it." => "... resulting in precipitation over the target region". Please use the abbreviation MTP after introducing it.

"The pattern is not only statistically significant but also consistent with Eulerian fluxes diagnosis, changes in the frequency of circulation types" => I suggest changing to "The pattern is statistically significant and consistent with changes in the vertically integrated moisture fluxes and frequency of circulation types." It will make the abstract stronger if the authors add a sentence briefly specifying what are these consistent changes in the IVT and circulation types.

Please remove the statement "and any of the known mechanisms of the effects of the increments of precipitation as snowfall or rainfall on ice in the Arctic." - this sounds very vague, encompassing too many complex processes and feedbacks, and not the result of the present study.

**Page 2:**

The authors introduce two different abbreviations for the same term - "Arctic sea ice extension (SIE)" on page 2 and "Arctic sea ice (ASI) extension" on Page 4. I suggest to change "extension" to "extent" and use one abbreviation - Arctic SIE.

**Page 5:**

"defined in point 2.2.1." => section 2.2.1

"As in the previous one, there are two horizontal lines, which correspond to the mean of the data before and after the AMOC change point (the 286th month of the series, that is -

October 2003). Those means are 0.41 and -0.74, respectively."

=> please say specifically "to the SIE mean" instead of just "mean of the data"..

"Those means are 0.27 and - 0.91, respectively" and "those means are 0.41 and -0.74, respectively " - what are the units? I suppose million sq km if this is sea ice extent? Please check throughout the article text that the units are defined everywhere.

**Figure 2:**

- 1) Units are missing.. The yaxis title has to be more meaningful, i.e. "Sea ice extent monthly (daily) anomalies, units". That it is based on 37 years - this is additional information that has to be moved to the caption. The number of data points is redundant information (obvious from the plot).
- 2) xaxis: Please add a second y-axis on top indicating years; I suggest also changing "Day" -> "Days since..." and "Months since..."
- 3) Please make the red line thicker - together with years indicated on the top y-axis it should clearly show that it corresponds to 2003

**Comment on teleconnection patterns:**

*You are right. We have supposed readers familiar with teleconnection patterns and their phases. According to the NOAA definition "The term teleconnection pattern alludes to a recurring and persistent large-scale pattern of pressure and circulation anomalies that spans vast geographical areas. These patterns have strong influence on temperature, rainfall, storm tracks, and jet stream location/ intensity over vast areas and consequently are often assumed as responsible for abnormal weather patterns occurring simultaneously over seemingly vast distances". We included in the main text of the manuscript the known web page from NOAA <http://www.cpc.ncep.noaa.gov/data/teledoc/telecontents.shtml> where the patterns are described and their phases plotted. For instance, the East Atlantic pattern consists of a north- south dipole of anomaly centers spanning the North Atlantic from east to west with the positive phase with positive anomalies in the south pole, the one placed in the subtropics (see figure below)*

There is no need to explain what the term "teleconnection pattern" means - neither to me nor to the readers of ESD. I invited the authors to explain the specific patterns discussed in their study.