L. Istomina, G. Heygster, M. Huntemann, P. Schwarz, G. Birnbaum, R. Scharien, C. Polashenski, D. Perovich, E. Zege, A. Malinka, A. Prikhach, and I. Katsev: "**The melt pond fraction and spectral sea ice albedo retrieval from MERIS data: validation and trends of sea ice albedo and melt pond fraction in the Arctic for years 2002–2011**", The Cryosphere Discuss., 8, C2723–C2723, 2014;

Review

The above mentioned paper presents a melt pond and albedo data set derived from MERIS satellite data, shows its validation and trends.

As the title already shows, this paper contains information for minimum two papers, better three.

My suggestion: to make the paper interesting and worth reading it, I address the authors to make major revisions and publish at least two papers out of the material that is presented here.

The subject itself and the outcome have definitely a high value for the science community, therefore I highly recommend to put some more work into this paper and proceed with publishing the results.

Major issues:

The first one should focus on the algorithm and its validation. The methodology of the melt pond/albedo data set is shortly summarized at pp 5231 ff., but there are many open questions, like:

- Why are you using MERIS channels 1,2,3,4,8,10,12,13,14? How do you resolve these information?
- How is the atmospheric correction processed? How do you calculate ri and ti?
- What are the criteria for separating cloud, land and open water pixel? Please specify numbers.
- Mention the "borders values". Please specify numbers.
- Why you choose the Newton-Raphson method?
- How do you calculate the albedo from S?

To understand the paper properly, the algorithm should be comprehensible and reproducible for the reader. In this paper it is not the case due to missing information (see list above).

In the introduction and the validation chapter I found a hint to Zege et al, 2014 (in review) that seems to be a proper algorithm description. If this is the case, please refer also in the data chapter to this paper and provide a manuscript of the paper to the reviewers. But the validation of a product should be part of the algorithm paper…. This is a little bit confusing for me.

Another major point is that there is no detailed product description.
Chapter 5 says "…analysis over the whole MERIS dataset" and further on you mention weekly resolution. How are these products created? What are methods to receive a weekly resolution, who do you handle data gaps (i.e. cloud contamination) in this case?

Isn't Chapter 4.1 ("Gridding") part of the product description? Why is it in the chapter "Case studies"?

Chapter 5.1 gives a comparison of the ice situation of the summers 2007 and 2011. Roesel and Kaleschke (2012, JGR) did already a similar study on this topic. Are your results different? At least mention their publication in this context.

Minor Issus:

Avoid citation in the abstract.

I cannot find any of the correlation values given in the abstract in the validation chapter. Please provide the numbers there and not in brackets in the abstract. Why don't you give R^2?

You mention a cloud filter in the abstract – I cannot find a proper description of a newly developed "dynamic spatial cloud filter for MERIS over snow and ice" – This is a topic for a separate publication! (See comment above)

Is the cloud screening only used for validation data? Why not for the entire dataset?

Table 3: could you plot the data? It would be maybe easier to read as in a table.

Is it possible to plot the validation data together in one or two figures instead of more than 10 (fig 4-18)?

Plot figure 19 and 20 into one figure. That makes comparison easier. Plot also MPF into it.

The conclusion is hard to read and to understand. Please avoid the bullet points and form proper sentences without brackets.