Review of re-submitted manuscript of Finger et al., ACPD 2015 (acp-2015-321):

General comments

The re-submitted version of the study entitled "Spectral Optical Layer Properties of Cirrus from Collocated Airborne Measurements and Simulations" is focusing on a different case study and has generally improved. However, readability can still be improved for example by simplifying sentence structures and writing shorter sentences. Also, the authors should pay attention to precise language (when describing parameters) and complete labeling of the figures (see minor comments below).

Major comment

The title and the abstract suggest that more than one case study is analyzed. Only later in the text it becomes clear that ONE case study (now: 30 August 2013) is studied in detail here. I suggest you add this information in the title and the abstract which otherwise are misleading (the reader expects results "collected in two field campaigns over the North Sea and the Baltic Sea in spring and late summer 2013.", p. 1, line 9-14).

p.7, line 191: So if I understand correctly, the lower cirrus layer as well as a water cloud are situated below the cirrus layer that is analyzed in detail from now on? – Please clarify and add a sentence on that.

p.9-10, line 290-294: Not sure what you mean by a "typical cirrus". – Cirrus geometrical thicknesses vary greatly. You might consider to rephrase as "a rather geometrically thin cirrus". – Only here you state that from now on you are focusing on the lower cirrus layer between 6.7-8.5km. – It'd be easier to follow if you introduce the two layers as well as which part of the analysis you will do for them earlier on. On line 294 you mention that the lower cirrus with optical thickness of 1 is "a typical" one. – I suggest to delete that or give a range of "typical" cirrus optical thicknesses based on a reference.

p.12: It is a good idea to include a figure (Fig.13) describing the influence of a water cloud with different properties on the cirrus radiative forcing. Unfortunately, much of the description of Fig.13 is unclear. Relative or absolute differences are listed (p.12, lines 371-373, e.g., 72% to 83%...10 Wm-2 to 32Wm2 etc) but it is not clear what these differences refer to. – Please clarify the paragraphs describing Fig.13.

p.12-13, lines 396-399: This sentence is unclear. What do the 11% refer to? In general, sometimes it might be better to make two sentences instead of a very long one in which it is difficult to follow what the sub-sentences are referring to…

Minor comments

p.1, line 3: not “the” cirrus layer but “a” cirrus layer.

p.5, line 139-140: The sentence about air mass transport into the stratosphere is totally out of context here. Either delete or expand on it, so it fits into the context.

p.5, line 145: Introduce that you are analyzing a double-layer cirrus case as shown in Fig.5.

p.6, line 165-166: This sentence doesn’t make sense to me. The optically thicker cirrus which has a geometrical depth of 200m is the upper one (9-9.2 km). Here it sounds like as if you are referring to the lower one between 6.7-8.5 km (geometrical thickness of 1.8 km).

p.6, line 174: “manoeuver**s**”

p.7, line 201: …due to low clouds AND the cirrus layer at 6.7-8.5 km?

p.11, line 334: Choose a more descriptive title such as “Impact of a underlying low-level cloud on cirrus optical properties”

p.11, line 338: “two conditions” instead of “two cirrus cases”, since you state that the SAME cirrus at 6.7-8.5 km is analyzed here.

p.11, line 340: Explain why you use a water cloud with tau = 20 here. (MODIS?)

p.13, line 407: Suddenly you refer to the “measurement flights” – why plural now? You present one case study.

p.13, line 413: always add “%” after each percentage value throughout the text, even if you list several ones.

p.13, line 416: “influences”, not “influenced”

p. 13., line 416: “ice crystal shapes” instead of “shapes”

p.13, line 416: “changing surface albedo during the flight” instead of “changing albedo”

p.13, line 419: “properties” instead of “property”

p.19, caption of Fig.5: “layers” not “layer”

p.20, caption of Fig.6: There are two vertical dashed lines. So I assume you meant to write “the period between the two vertical dashed lines” …

p.20, caption of Fig.7: a) unclear which line is dotted and which one solid. I see two solid lines and one dotted line but the caption only refers to one solid and one dotted line. Maybe mark with arrows in the figure itself. Again, not sure if the mean of the measurement period between the two vertical dashed lines in Fig.6 is meant or if a single measurement example is shown. – Clarify.