

## ***Interactive comment on “EARLINET instrument intercomparison campaigns: overview on strategy and results” by U. Wandinger et al.***

**Anonymous Referee #2**

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The paper describes several comparison campaigns within the EARLINet framework. The manuscript tackles a very difficult subject area, but provides the necessary insight into the challenges of operating a network composed of several different hardware lidar configurations. The manuscript describes the campaigns that took place over several years in a variety of locations and conditions. The document was very difficult to follow in detail. The primary reason was that the lidar systems being compared have an institutional name, instrument name and ID name. The ID name is used on all the plots and tables but the manuscript uses all of them interchangeably – making it very difficult to follow the story line. I would strongly suggest that the ID name needs to be present in each reference (this is done sometimes) in order to give a more consistent and easier read. One glaring omission in the paper is there are no daytime measure-

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ment comparisons. This seems to me to be a major problem. The EARLINet data sampling is predominately done during the daytime hours and yet even though data was taken during the daytime hours in the comparison campaigns, none of that data is reported. Given all of the days of observations it would be advantageous to show more comparison data statistics (daytime or night). There is only the one two-hour data comparison from “twenty measurement sessions of 1-3 hour duration on 11 days”. I believe it would also be useful if there was a separate comparison of the reference lidars (and perhaps more exhaustive). Just from the one two-hour data set it is clear that there are inconsistencies between the reference lidars. This is problematic when they use three different reference lidars for the other site campaigns. It begs the question as to what are you comparing the “non-reference” lidar with. The figures shown are all necessary but there are a few suggestions: 1/ Fig 2c – add “11” to the Y-axis 2/ Fig 5b – decrease vertical scale so the plots are more visible 3/ Fig 5f – same comment as above 4/ Fig 6b – same comment as above 5/ Fig 6f – same comment as above

There are a few awkward sentences that need to be re-written: line 515, 517, 518, 537, 992. The authors mention that the signals were averaged between 30 to 120 min. This needs to be specified more clearly in the comparison. A factor of 4 averaging is significant in this type of comparison. It is not clear to me how the percentage difference is calculated on lines 755 and 756. From the data shown the percentage looks to be larger than stated. Line 926 – the deviation seems a little small – if a line were drawn on the fig at 0.01, would the data fall below?

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