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## ***Interactive comment on “The European lightning location system EUCLID – Part 1: Performance validation” by W. Schulz et al.***

### **Anonymous Referee #2**

Received and published: 2 October 2015

General comments: The paper is of interest and should be published after revision. Taking the actual contents of the paper the reader gets the impression that this is a report on Aldis GBT examinations, rather than on Euclid. Moreover, a large fraction of the reported information is already known and published. Nevertheless, the compilation of different aspects related to DE and LA is useful and gives an excellent overview. Still, there is dominant reporting about GBT, but very little on the entire Euclid area. Since this discrepancy is not readily remedied, the title should be changed. The paper uses very heavily internal measuring and analysis information from Vaisala (the producer and owner of both HD and SW of the described networks), although the name is not mentioned. The impression of having some company influence could be countered by considering the scientific principle to place the described results in a more general con-

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text, namely by mentioning alternative principles and other lightning detection networks that yield similar results related to DE and LA.

Specific comments: 1. p.5326 Line 9 and ch. 5.1. It is stated that the media LA is in the range of 100m; it should be made clear that this value does not apply to the total network but only to some smaller areas, and that the Euclid-typical error is listed as 500m (p.5334 line27). 2. the authors should give the scatter, especially the upper half-width of the error distribution, for the data that is derived from CHI2 analysis and does not refer to GBT. 3. the median LA results from the well-known error ellipse. A quantitative result implies assumption about the data error in the least-squares fit. The authors should explain what errors they assume and whether these errors are the same in the entire network. 4. p.5327 line 6. It should be clarified here that rocket-triggered lightning is not used in the present paper. 5. ch. 5.1 and Fig.5. Many improvements of the LA are mentioned, but all of them refer to the TOA locating technique. The authors should explain to what extent direction finding (DF) affects the LA. It is well known that almost 50% of all locations from Vaisala networks are produced with 2 and 3 sensor reports; thus, TOA is not effective and DF is dominant. As a result, since DF is intrinsically inaccurate, large errors and many outliers are present. The authors should show a graph that displays the number of sensors used for a locating process, preferably for two areas with small and large baselines, where TOA is more or less dominant, respectively. 6. ch.5.1 p.5334 line 27. It is stated that the LA of the entire network is around 500m. A value like this is not new and has always been stated by Vaisala and in Vaisala-related analysis work by scientists, at least since 10 years. The authors may explain this discrepancy. 7. Fig. 5 must have a better caption. The dimension should be given (km). The legend gives the lower value of an error interval (zero!). 8. ch.5.2.1 DE around GBT. It is stated that the DE for 2 kA strokes at GBT is 70%. How many sensors contribute to this type of stroke locating? 9. ch.5.2.2 and Tab.3; DE in the network. A paper on performance of Euclid should give more information about the DE. This chapter is much too short. At least a DE map should be given for the entire area, along with proper definition of DE 10. ch.5.3. and Fig.

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8/9 on peak current. In other publications much smaller errors are claimed. Here, it is surprising that peak-current errors as large as 50% seem to be frequent. The authors should give an explanation.

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Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 3, 5325, 2015.

**NHESSD**

3, C1880–C1882, 2015

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