

Interactive comment on “Evaluation of Single- and Multiple-Doppler Lidar Techniques to Measure Complex Flow during the XPIA Field Campaign” by Aditya Choukulkar et al.

Anonymous Referee #2

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The paper "Evaluation of Single- and Multiple-Doppler Lidar Techniques to Measure Complex Flow during the XPIA Field Campaign" presents an overview of single- and multi- Doppler scanning methods operated during the XPIA campaign. The focus is on the scanning method description and their ability to retrieve the wind vector components. The described scanning methods consist of PPI and RHI scans, and thus the methods themselves are not novel. From the manuscript, readers can conclude that retrieval of the wind vector components using unsynchronized multiple scanning lidars brings poor accuracy. This is logical due to the non-stationarity of the atmosphere (the author commented this as well). Therefore, this information does not bring anything new to readers. The author concluded that as the complexity of the scanning

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method increased the uncertainty in the wind vector retrieval increased as well. This is a misleading conclusion. In this specific case, the increase in complexity brought the increase in the lag between the lidars, which in turn resulted in a poorer estimation of the wind vector components (as expected). Furthermore, the author presented the comparison between the retrieved single- or multi-Doppler wind vector acquired over the shortest time period (not averaged = 'instantaneous') and the averaged sonic data. I find this approach odd. In the case of multi-Doppler retrievals, lidars were not synchronized and comparing the retrieved information without first averaging over a certain period will not produce good results (common sense). The same stands for the OI method. I suggest to the author to reformulate the paper and investigate trade-offs between the averaging period and spatial coverage instead. Furthermore, I strongly suggested to the author to follow the Vancouver protocol, and include only those co-authors that substantially contributed to: 1) conception and design of the study, or analysis and interpretation of data 2) drafting of the manuscript or revising it critically for important intellectual content 3) the final approval of the version to be published

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