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Could be LIDAR a stand alone option for vertical wind profiling?

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There are several techniques for wind vertical profiling without the need of towers. Mostly of them where developed and tested some decades ago but, during the last years, due to the good performance and affordability of the newer developments, are being seeing as serious alternatives to the classical anemometric tower. For some locations, these systems are seen as the only option due to the difficulties for a tower installation. They also bring new possibilities, thanks to their portability and mostly of them are ready for remote and unattended operation. Nevertheless, few are the evaluations of these commercial systems in relation with anemometric towers besides commercial and some other partial information. The purpose of this study is to analyse the relation between the measurements made by a classical anemometric tower and the measurements obtained by a commercial LIDAR. Besides considerations due to performance, reliability and data coverage, also wind profiles and wind frequency distributions are compared. Even though, they make use of different measurement principle, the deviations are discussed and the influence of environmental and other factors is analysed. A final discussion is made about the possibility of using LIDAR as a stand alone tool for vertical wind profiling of the first meters of the troposphere and some suggestions for further investigation are addressed.