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Atmospheric Boundary Layer Height Estimations during the LASIE Experiment

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Coastal regions are the most populated areas of the globe, and there is a growing need for accurate and efficient prediction systems for environmental applications. At the present stage of environmental prediction science and technology, the development of efficient and accurate high-resolution coupled coastal prediction systems is possible. The key physical problems fundamental for the improvement of the high-resolution these systems are associated with the atmospheric and oceanic boundary layers. The Ligurian Air-Sea Interaction Experiment (LASIE) is a multi-institutional intensive field campaign carried out in the Ligurian Sea. The main scientific goal of the campaign was to contribute to the development and evaluation of parameterizations of the atmospheric and oceanic boundary layers and their interactions. During the LASIE campaign detailed observations of the oceanic and atmospheric boundary layers were obtained, from ship based meteorological and oceanographic sensors and radiosondes, and from two meteo-oceanographic buoys moored in the Ligurian Sea. In the present study the height of the marine atmospheric boundary layer (MABL) is derived using two different measuring systems (Radiosounds and LIDAR observations). Several methods are applied to these observations. The results are compared between themselves and against MM5 and WRF runs. The comparisons show good agreement leading to the conclusions that the application of LIDAR systems to retrieve the mixing height can be achieved, even in coastal regions.