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Validation of MERIS cloud top pressure with airborne LIDAR measurements

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MERIS (Medium Resolution Imaging Spectrometer) on board the ESA satellite ENVISAT provides radiation measurements within the oxygen-A absorption band around 762nm. These observations are used to derive the cloud top pressure. In order to validate this product, several measurement flights were conducted in the north-eastern part of Germany between April and June 2004. The Cessna T 207A of the Free University of Berlin was equipped with a LIDAR (POLIS) and a GPS system. POLIS (Portable Lidar System) was provided by the LMU München and performed observations in the nadir direction. Because the reflectance of the Earth and the optical properties of the clouds are known to influence the accuracy of the cloud top pressure retrieval, it was a main goal to examine miscellaneous cloud types over several surfaces, e.g. forest or water. The comparison of MERIS and POLIS measurements revealed a high accuracy of the MERIS cloud top pressure product. The root mean square error resulted in ˜180m with a bias of ˜150m. The validation campaign and its results are presented.