

A new and simple parameterization of the planetary boundary layer height

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The atmospheric boundary layer height (BLH) is a very important quantity within the climate and climate models. It is a controlling factor in determining for example near surface heat and wind. However observing and modeling the BLH is until today a difficult task especially in a global context. Using ERA-Interim monthly mean global data a linear dependency of the BLH on the physical parameters near surface temperature and relative humidity is found. While the BLH and the relative humidity are negatively correlated almost everywhere the BLH and the near surface temperature are positively correlated over land and ice, with the exception of the Himalaya region, and negatively correlated over the ocean. Based on these findings a new and simple parameterization of the BLH is found including only linear equations using purely physical parameters and differentiating between land/ice and ocean. This parameterization has an explained variance of 0.7 over land/ice and of 0.65 over the ocean. Known weaknesses are deserts and the Himalaya region.