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Direct observations of daytime atmospheric boundary layer

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The daytime growth of atmospheric mixed layer is important in time variation of air pollution over big cities. The depth variations of this layer can be estimated from direct measurements and also from numerical forecast models if the model is properly calibrated. The depth of the daytime mixed layer for the city of Zanjan (48.5 N, 36.7 E, 1700 m) has been studied using a LIDAR (532nm) system, which works on aerosols scattering of laser light. The mixed layer depth (zi) for Zanjan city is found to be between1 km typically in spring to 3 km in summer for synoptic calm conditions. In entrainment zone, the observations show signs of K-H instability especially in cases with strong shear in this zone. Also the MM5 forecast model with a proper boundary layer scheme (MRF) is used to estimate (zi) which shows rather good agreement with direct observations using LIDAR system.