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Forecasting the weather
- ensemble techniques
in probabilistic weather prediction

Diurnal variations in surface air pressure, integrated water vapour, and stratospheric ozone

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Diurnal variations of atmospheric parameters including diurnal variations of atmospheric gravity waves are still a challenge for numerical weather prediction models and satellite observation systems. Thus it is valuable to derive characteristics of diurnal variations from ground-based observations having all daytime, all season, and multiyear coverage. The University of Bern and MeteoSwiss (Payerne) continuously operate microbarometers, water vapour radiometers, and ozone radiometers yielding long-term series of surface air pressure, integrated water vapour, and stratospheric ozone with a time resolution of minutes or seconds in local solar time. We derive the mean diurnal variation of these parameters. Further we study the diurnal variation of the amplitudes of quasi-periodic atmospheric fluctuations (period range 4-60 min). Since the surface, the troposphere, and the stratosphere are closely coupled by insolation, tides, and gravity waves, we expect to find similarities in the observed diurnal variations of surface air pressure, integrated water vapour, and stratospheric ozone.