ID: Type: **Oral**

middle atmosphere weather models using LiDAR and ambient noise

In routine processing of IMS infrasound data at the IDC, microbaroms with dominant frequencies ranging from 0.1 to 0.5 Hz appear in overlapping frequency bands and are considered as noise. In this study, microbarom signals were used as calibration signals, and their amplitudes at the German infrasound station IS26 were modelled based on operational ocean wave interaction simulations and a semi-empirical attenuation relation. This relation strongly depends on the middle atmosphere (MA) dynamics; however, vertical temperature and wind profiles, provided by numerical weather prediction (NWP) models, have exhibited significant biases when compared with high-resolution LiDAR soundings. A fully autonomous LiDAR for MA temperature measurements was installed at IS26 for estimating uncertainties in the modelled amplitude. Temperature and wind perturbations, considering observed biases and deviations, were added to the operational high-resolution atmospheric model analysis produced by the European Centre for Medium-Range Weather Forecasts. Such uncertainties in horizontal winds and temperature explain 97% of the actual detections, compared to 77% when using the direct NWP model output. Incorporating realistic wind and temperature uncertainties in NWP models, obtained by high-resolution LiDAR measurements, can thus significantly improve the understanding of a station's detection capability throughout a year; especially during the hemispheric summer seasons.

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Track Classification: Data Processing and Station Performance