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Temperature and wind atmospheric lidars as tools for the validation of infrasound propagation models

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Rayleigh temperature and Doppler wind lidars are powerful instruments to monitor the vertical profile of atmospheric parameters up to the upper mesosphere. Such instruments are operated routinely at Haute-Provence Observatory (OHP) in South-East France and at Maïdo Observatory in Reunion Island in the frame of the Network for the Detection of Atmospheric Composition Change (NDACC) and they are included in the ARISE (Atmospheric dynamics Research InfraStructure in Europe) project. They allow to monitor the long-term evolution of the middle atmosphere in relation with global climate change and to study the role of atmospheric waves (gravity waves, planetary waves, sudden stratospheric warmings) in the variability of this region at various scales. Using the lidar profiles of wind and temperature, it is possible to reconstruct the vertical profile of effective sound velocity and to compare it with the prediction of infrasound propagation simulations using Numerical Weather Prediction models. The colocation of temperature and wind lidars and microbarometer arrays at OHP and Maïdo ARISE sites offers a great opportunity to evaluate the added value of such lidars for the interpretation of infrasound detection.

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