



Synergy between infrasound, lidar and airglow layer observation networks for atmospheric studies

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It is proposed to associate infrasound, lidar and mesospheric observation networks to provide a new “3D” image of the atmosphere from the ground to the mesosphere. The three existing networks are:

- the International infrasound network developed for the verification of the Comprehensive nuclear Test Ban Treaty (CTBT)
- the Network for the Detection of Atmospheric Composition Changes (NDACC) which uses Lidar to measure stratospheric dynamics,
- the Network for the Detection of Mesopause Changes (NDMC), dedicated to airglow layer measurements in the mesosphere,

These networks can be completed by complementary infrasound stations and satellite observations. The coverage extends across Europe and outlying regions, including polar and equatorial regions. The network will provide important new measurements of atmospheric waves in a broad frequency range including infrasound, gravity, planetary waves. The network will play a particularly important role in improving atmospheric measurement in the stratosphere. Recent work has shown that stratospheric variability, primarily caused by large, planetary-scale waves, is important for prediction of tropospheric weather and climate.

The expected benefits would be a better description of the atmosphere and atmospheric exchanges, leading to an improved accuracy in short and medium range weather forecasts. In the long term, observations can be used for monitoring changes in the occurrence of extreme events and trends in the middle atmosphere climate. The benefits also include civil applications related to monitoring of natural hazards as volcanoes.