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A high-density infrasound array of particle velocity sensors in the Netherlands

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A small aperture, High-Density Infrasound Array (HDIA) is being operated by the Royal Netherlands Meteorological Institute (KNMI). This 80 sensor array is part of the geophysical application within LOFAR, i.e. an astronomical low-frequency array in the Netherlands. HDIA occupies an area of 100 by 100 meter, so about the size of a noise reducer used in infrasound arrays for verification purposes. HDIA will be able to estimate the wind-noise correlation length, which has implications for noise reducer design. Of the 80 instruments, 74 are Microflowns. These measure particle velocity and have a directional sensitivity. If two of them are closely spaced, then the azimuth of the incoming sound wave can be calculated from the amplitude ratio. The field setup has 37 elements, each containing a pair of Microflowns. Six elements also have a pressure microphone. We will present the first results of using the vector properties of the particle velocity to estimate the direction of arrival (DOA) of events. These will be compared with DOA-estimates from beamforming of 1) the pressure data, 2) the particle velocity data and 3) pressure data of a nearby 6-element microbarometer array. Furthermore, the observed correlation length of wind will be discussed.