

Comparison of Infrasound Wind Noise Reduction Systems for Use in Temporary Deployments

Low frequency sound between 0.01-20 Hz, known as infrasound, is produced by a variety of natural and anthropogenic sources. Within this frequency band, wind is a persistent source of infrasonic noise. Infrasound sensors measure pressure fluctuations, which scale with the ambient density and velocity fluctuations of ground winds. Therefore, reducing wind velocity works to lower the signal detection threshold. Robust wind noise reduction methods have been extensively studied, but systems such as these are not ideal for temporary deployments. Here we compare four different wind noise reduction systems and make recommendations for temporary infrasound deployments. Our results show that there are two systems that are especially effective at reducing wind noise on Hyperion IFS-3000 series microphones: 1) a Hyperion high frequency (HF) shroud with a 1 m diameter metal mesh dome placed on top of it and 2) a Hyperion Four Port Garden Hose shroud with 4 Miracle-Gro Soaker System garden hoses. We also find that placing a 5-gallon bucket over the HF wind shroud provides a negligible decrease in noise up to 8 Hz and then an increase in noise. Both the soaker hose system and the Hyperion HF shroud and metal mesh dome perform the best, but it is up to the researcher to determine the which system is best for their needs based on location and funding for upkeep. We anticipate this study will be used as a resource for future infrasound deployments. For example, when a wind noise reduction method is necessary, but is only needed for a limited time period.

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