

LOW FREQUENCY ACOUSTIC FIELD OBSERVATIONS of ELECTROMAGNETIC RADIATION: Examples from IARO ACHE Shetland Islands

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Evidence submitted to USA HHS Request for Information on Electromagnetic Fields (EMFs), Radiofrequency (RF) Radiation, and Wireless Radiation Exposure

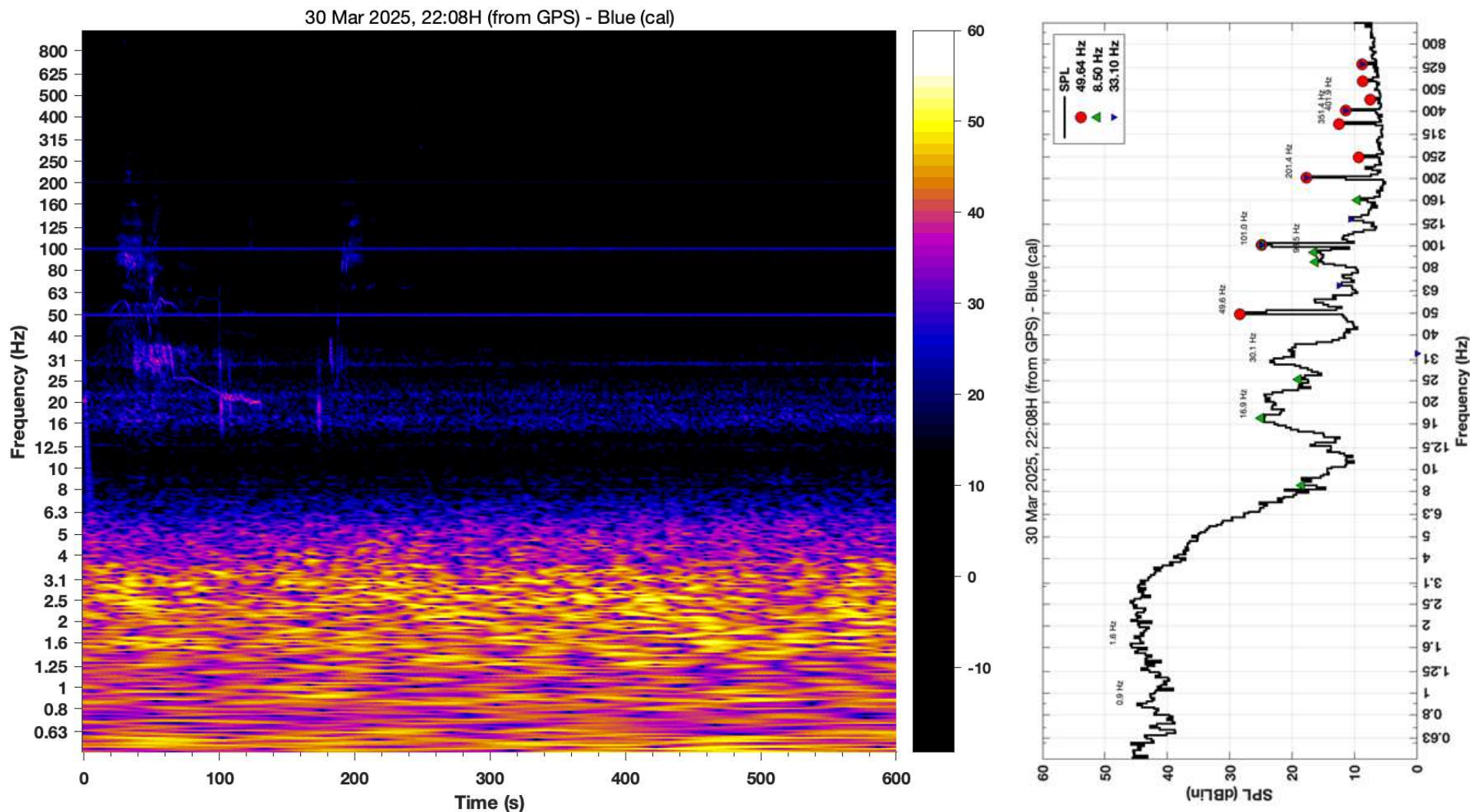
21 October 2026

This note presents data from environmental acoustic monitoring undertaken as part of the International Acoustics Research Organisation (IARO)'s Acoustical Characterisation of Human Environments research initiative, presented as evidence in support of the use of environmental acoustic monitoring as a complementary approach for characterising and understanding the electromagnetic radiation (EMR) environment.

All examples focus on the infrasound low frequency range (0.1 – 1000 Hz), and were collected inside homes in Shetland, Scotland, UK in 2025, using the IARO SRA Scribe system (MKII). Details of the instrumentation are available on the IARO website (iaro.org.nz).

It is important to note that the examples provided here are brief 10 minute snapshots, and that meteorological conditions strongly influence detection of electromagnetic radiation sources via the sound field, with light wind and stable atmospheric conditions favouring detection. Due to careful design, the instrumentation itself is not expected to be a significant source.

EXAMPLE 1: Acoustic detection of the local AC electricity supply inside a home.

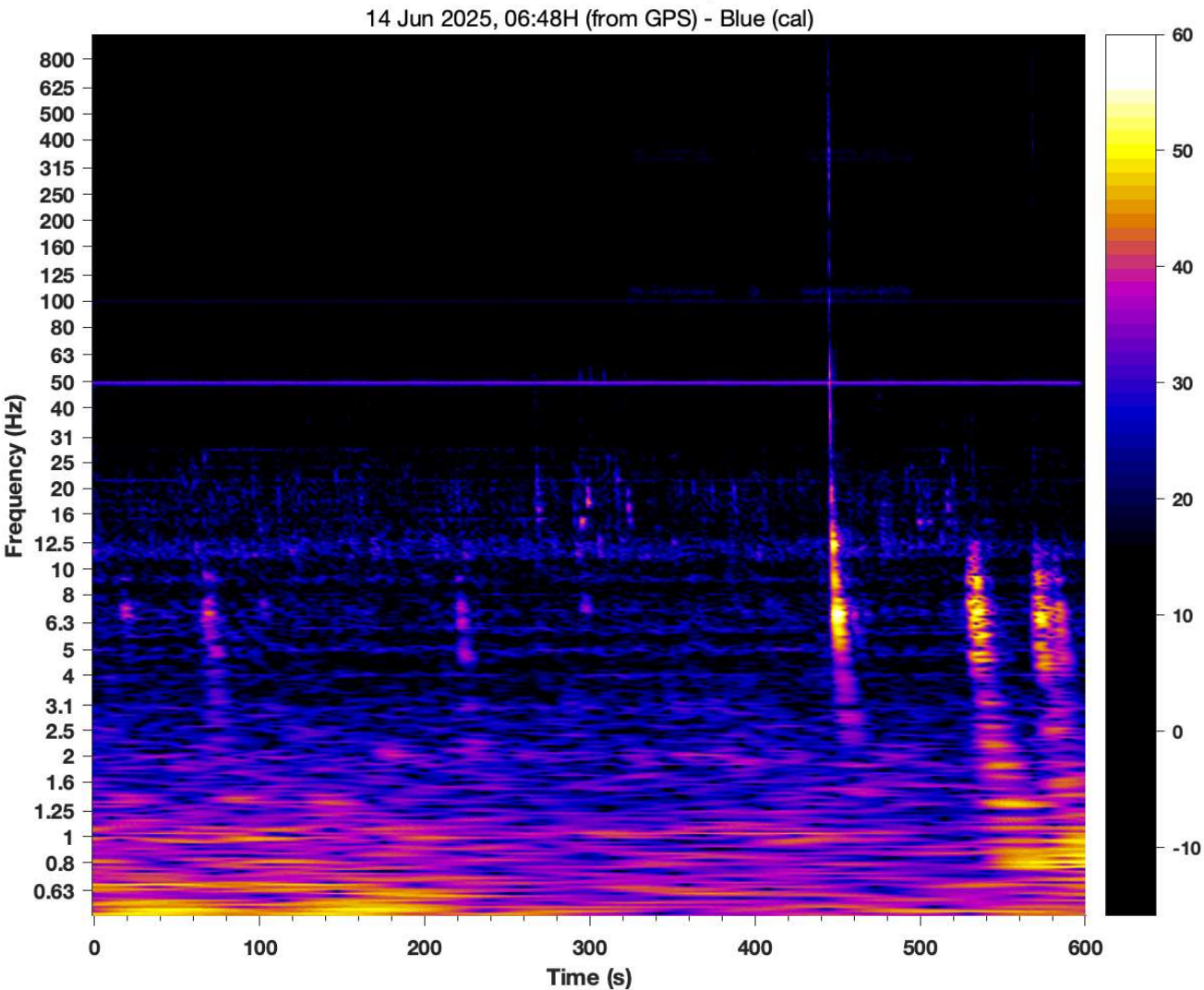


(a) Sonogram / acoustic spectrogram (SPL dBLin).

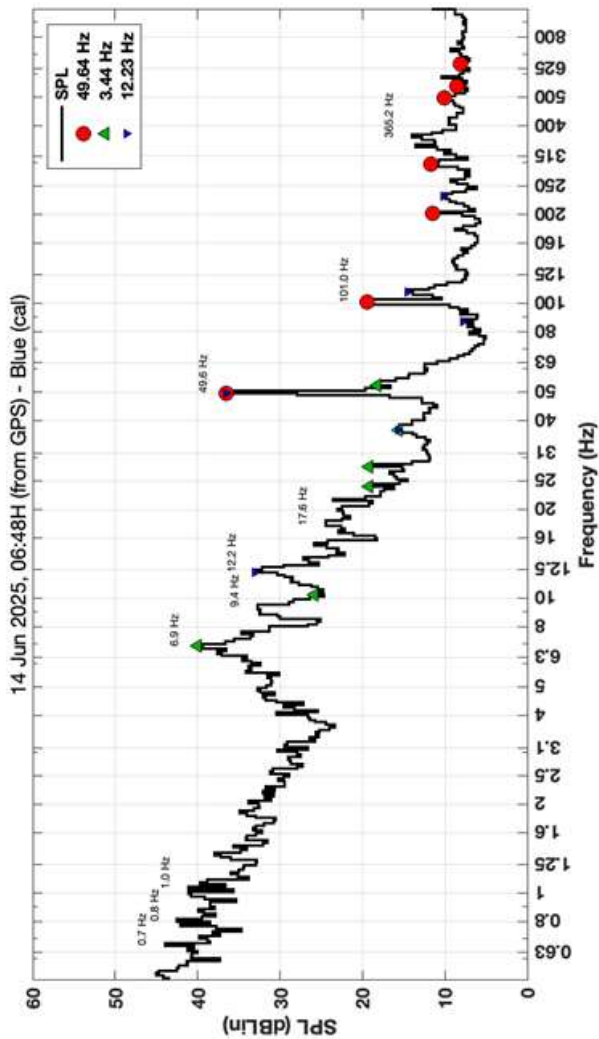
(b) Harmonic analysis (SPL vs Frequency).

Figure 1. Sound pressure level (dBLin) inside an occupied home over a 10 min period, for the infrasound low frequency noise range (0.1 – 1000 Hz). The local electricity supply at 50 Hz, and its 100 Hz harmonic are clearly visible as persistent tones for the duration of the segment (a), and are the most spectral prominent peaks, with a SPL of approx. 30 dB and 25 dB, respectively (b).

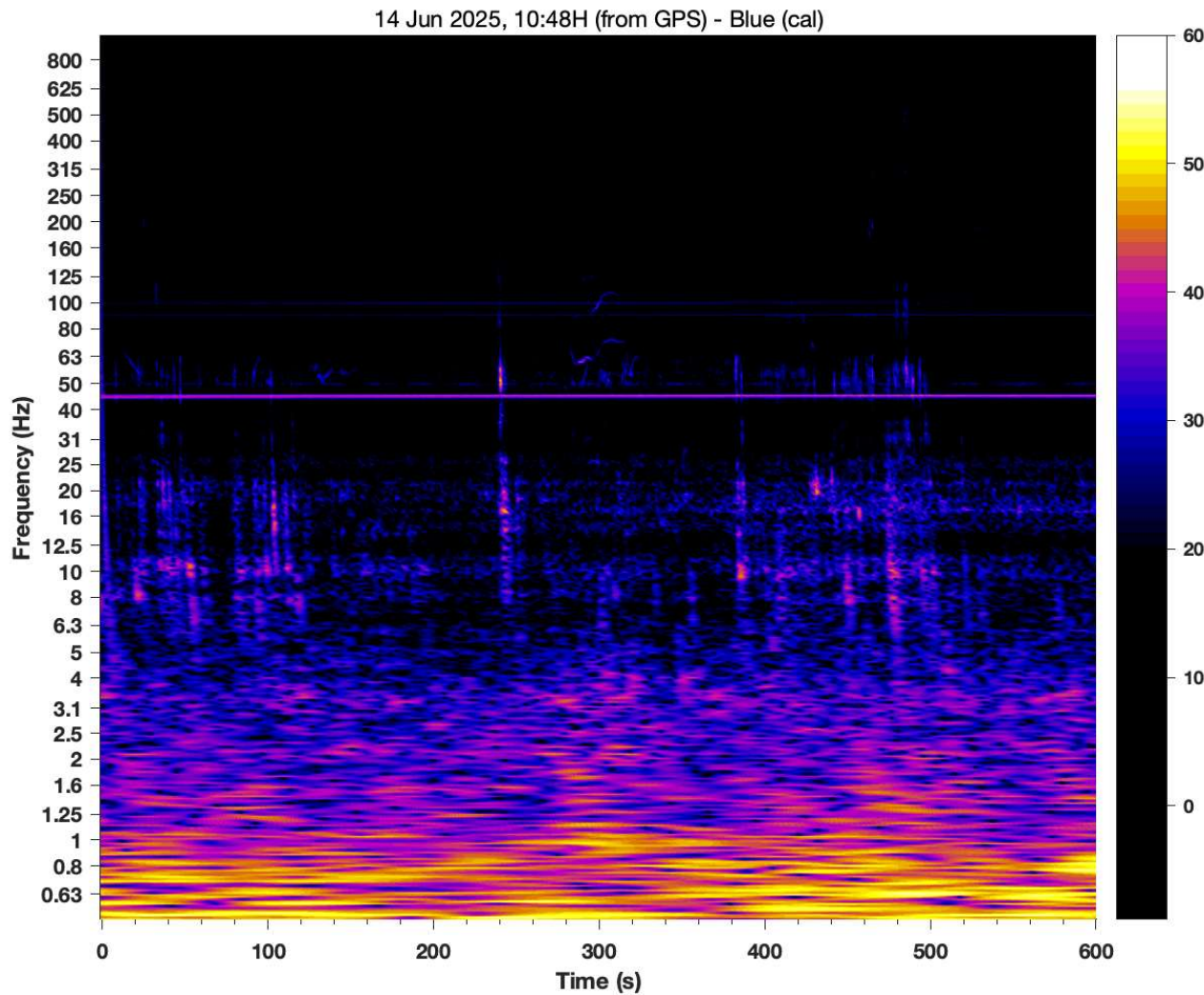
EXAMPLE 2: Deviation of the local AC electricity supply inside a home.



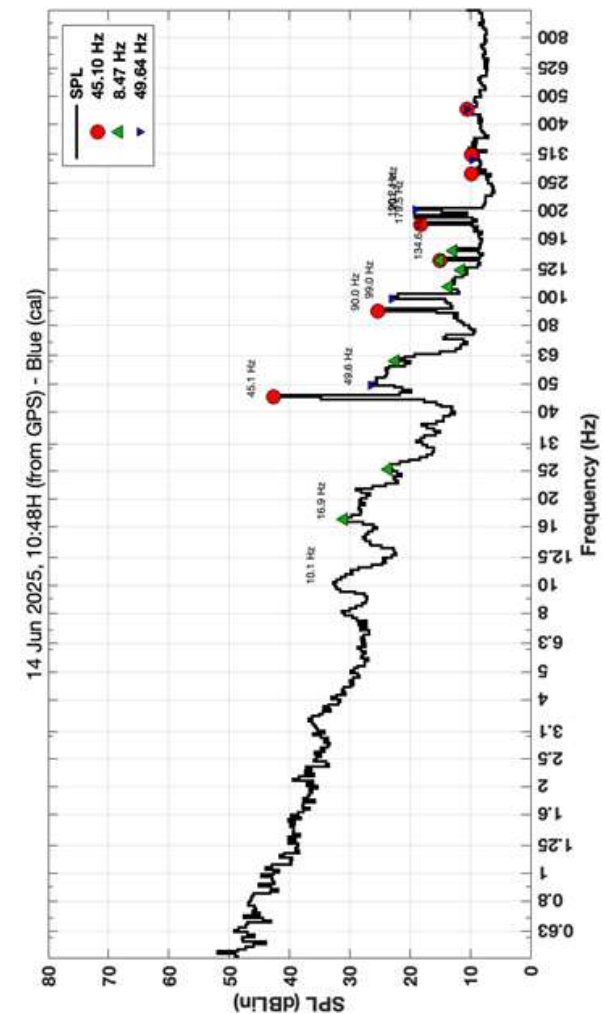
(a) Sonogram / acoustic spectrogram (SPL dBLin), 06:48 H.



(b) Harmonic analysis (SPL vs Frequency), 06:48 H.



(c) Sonogram / acoustic spectrogram (SPL dBLin), 10:48H.

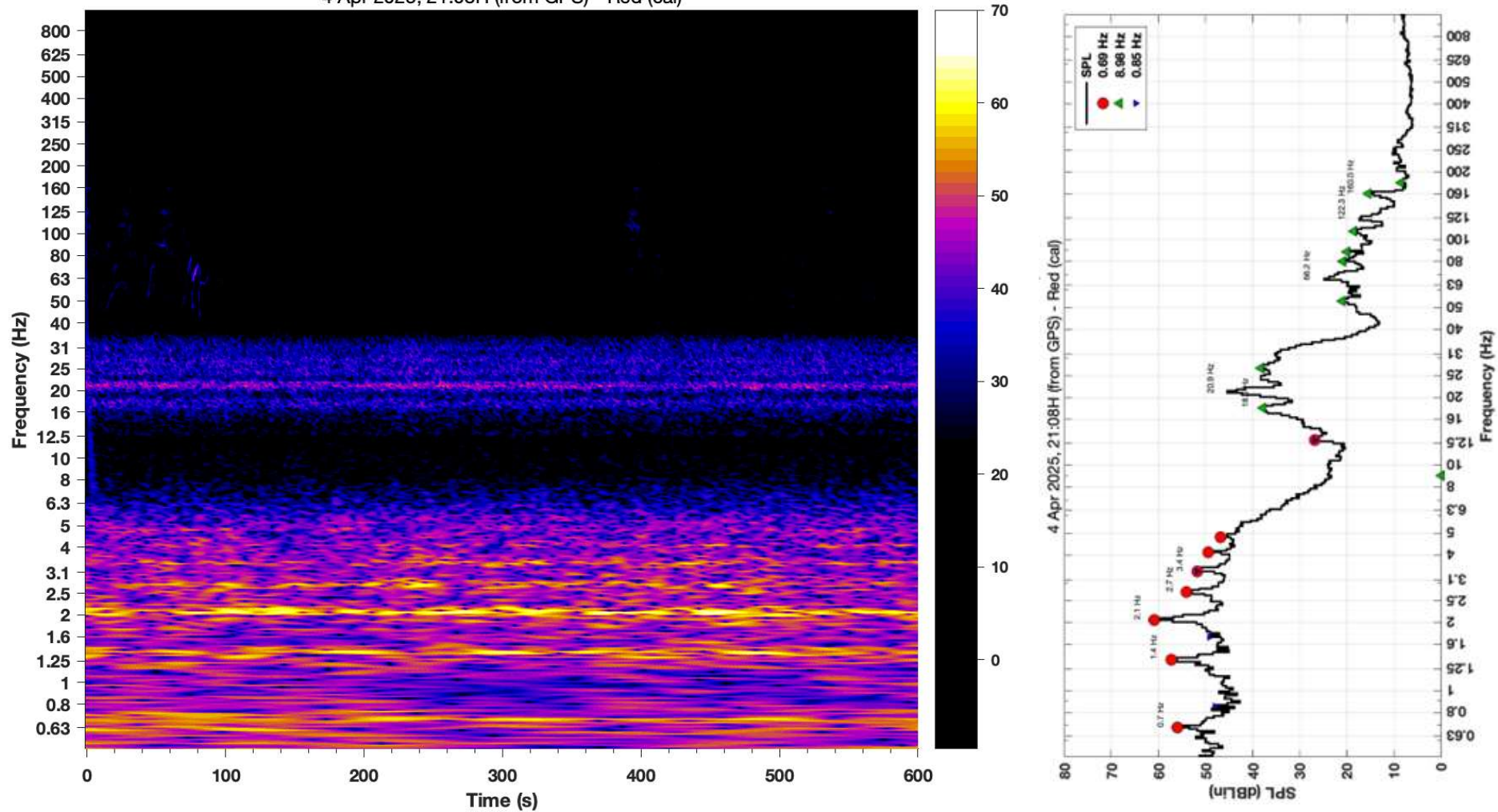


(d) Harmonic analysis (SPL vs Frequency), 10:48H.

Figure 2. Sound pressure level (dBLin) inside an occupied home over a 10 min period, for the infrasound low frequency noise range (0.1 – 1000 Hz). The electricity supply at 50 Hz, and its 100 Hz harmonic are clearly visible as persistent tones for the duration of the segment (a), and are the most prominent peaks with SPL approx. 47 dB and 20 dB respectively (b). Later in the morning (c) + (d), there was a notable deviation in the 50 Hz signal, dropping to 45 Hz (note: this 5 Hz deviation is considerably greater than the UK/NESO steady-state grid frequency statutory limit of $\pm 1\%$ (49.5 - 50.5 Hz), and occurred after the local wind farm began operating, and whilst a heavy electrical appliance (washing machine) was in operation).

EXAMPLE 3: Wind turbine acoustic pollution and strong Schumann Resonance (3rd harmonic).

4 Apr 2025, 21:08H (from GPS) - Red (cal)



(a) Sonogram / acoustic spectrogram (SPL dBLin).

(b) Harmonic analysis (SPL vs Frequency).

Figure 3. Sound pressure level (dBLin) inside an occupied home over a 10 min period, for the infrasound low frequency noise range (0.1 – 1000 Hz). The series of tones in the infrasound with a fundamental frequency of 0.7 Hz is from nearby Viking Energy wind farm. The broad energy peak centred around 20 Hz is the 3rd Schumann Resonance mode or harmonic (note: The Schumann Resonances are a naturally occurring geophysical phenomenon classically defined as low frequency electromagnetic waves, but they also appear in the acoustic field and some investigators have argued that they are better described as an electro-acoustic phenomenon).