Appendix I: Detection distance of a sound level meter

The estimation of the detection distance was driven by the conjunction of the sound level of the source, the frequency bandwidth of the source, the sound attenuation factors (spreading loss, atmospheric absorption, habitat attenuation), and the ambient sound level. Fig. I-1 shows the contribution of each type of attenuation to the overall attenuation of a wideband white noise source (0-20 kHz) broadcasted at 80 dB SPL re20 μ Pa at 1 m in two habitats, a Neotropical rainforest (French Guiana) and an Alpine coniferous forest (Jura, France).

The overall trend of the detection distance was similar to the detection distance of the SM4 ARU (See Fig. 4). The trend was slightly longer than for the ARU, in particular for frequencies above 10 kHz. This behaviour was due to the difference in the frequency response between the ARU (see appendix D) and the sound level meter. The sound level meter was therefore more sensitive to faint high frequency sound attenuated by a long distance of propagation.



Figure I-1: Detection distance of the sound level meter obtained with the model in: (a) a Neotropical rainforest (French Guiana); (b) an Alpine coniferous forest (Jura, France). The source was a wideband (0–20 kHz) white noise broadcast at 80 dB SPL re20 μ Pa at 1 m. The contribution of geometric (i.e. spreading loss) attenuation (Ageo, green), atmospheric absorption (Aatm, red) and habitat attenuation (Ahab, purple) are depicted with different colours.