

Appendix J : Detection distance variation of the ARU according to night and day cycle and month

In order to test whether the ambient sound or the environmental factors are the main drivers of the detection distance of the ARU, the ambient sound level L_n is fixed to the average yearly value for each frequency bins and hours of the day (i.e. contrary to the Fig. 5 and 6 in the manuscript) while the environmental factors (i.e. the ambient temperature and the relative humidity) still vary according to the values given by the loggers. Then, we calculated the detection distance of a 80 dB SPL white noise using the full propagation model defined in Eq. 4 and focused on the frequency range 1–8 kHz, where most of the biophony occurred. The results are summarized in Figs J-1 and J-2 where the detection distances appear as concentric circles regardless of the frequency band, meaning that the environmental factors play a minor role in the large variation of the detection distances observed in Figs 5 and 6. This result acknowledges that the main driver of the detection range of the biophony by the ARUs is the ambient sound level that is caused either by the biophony itself (i.e. background sound in contrast to the salient foreground sound) or by the anthropophony (i.e. mostly cars and aircraft traffic).

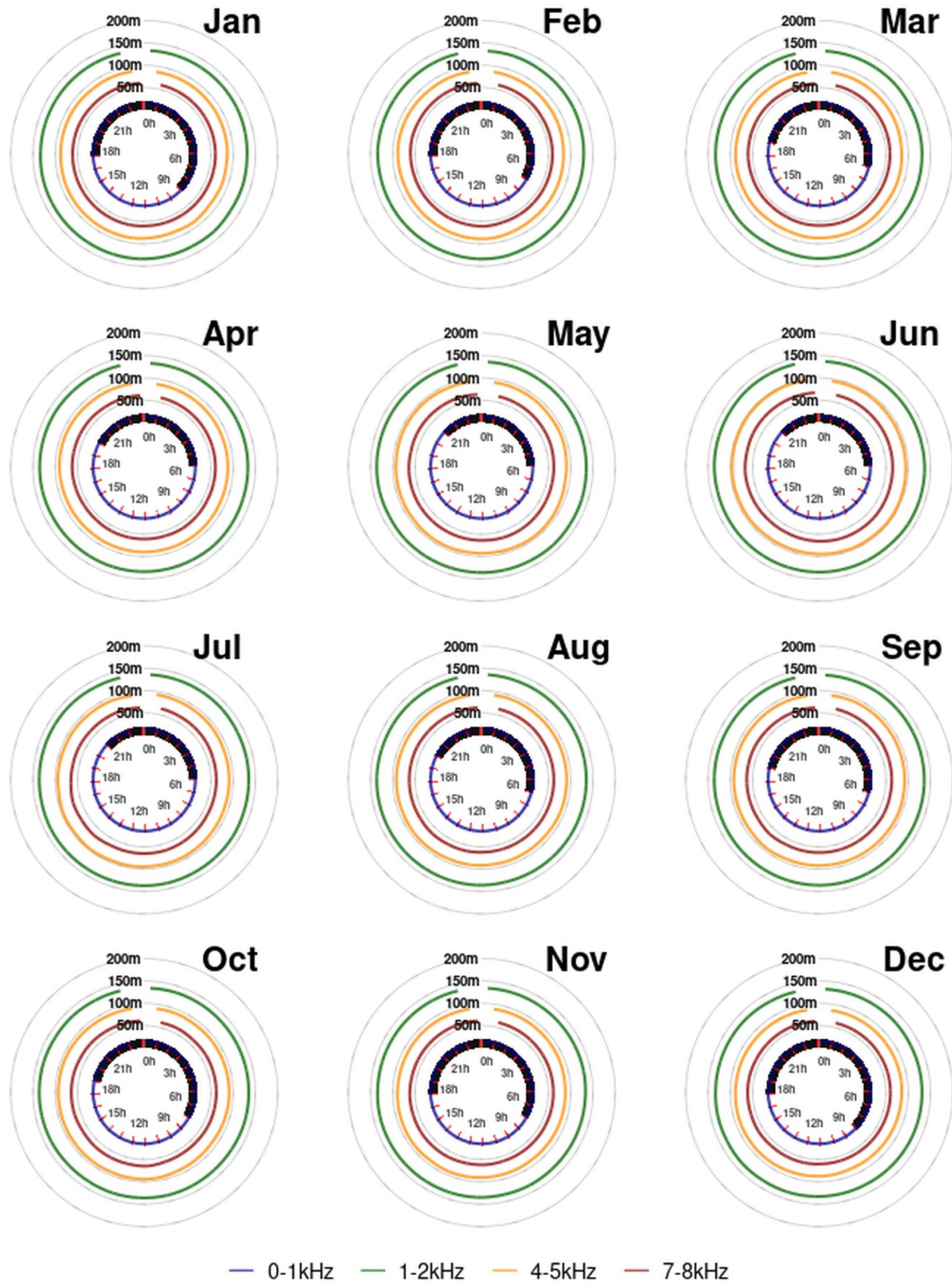


Figure J-1: Detection distance variation of the ARU according to night and day cycle and month in an Alpine coniferous forest (Jura) taken into account the variation of the environmental factors ($T^{\circ}\text{C}$ and RH). The sound source was a wideband (0–20 kHz) white noise broadcast at 80 dB SPL re20 μPa at 1 m. Each circular plot represents one month, with each circle corresponding to a propagation distance from 50 to 200 m by a step of 50 m over a complete day (white) and night (black) cycle. Line colours refer to four 1 kHz frequency bands (0–1 kHz, 1–2 kHz, 4–5 kHz, 7–8 kHz). The ambient sound level L_n is fixed to the average yearly value for each frequency bins and hours of the day.

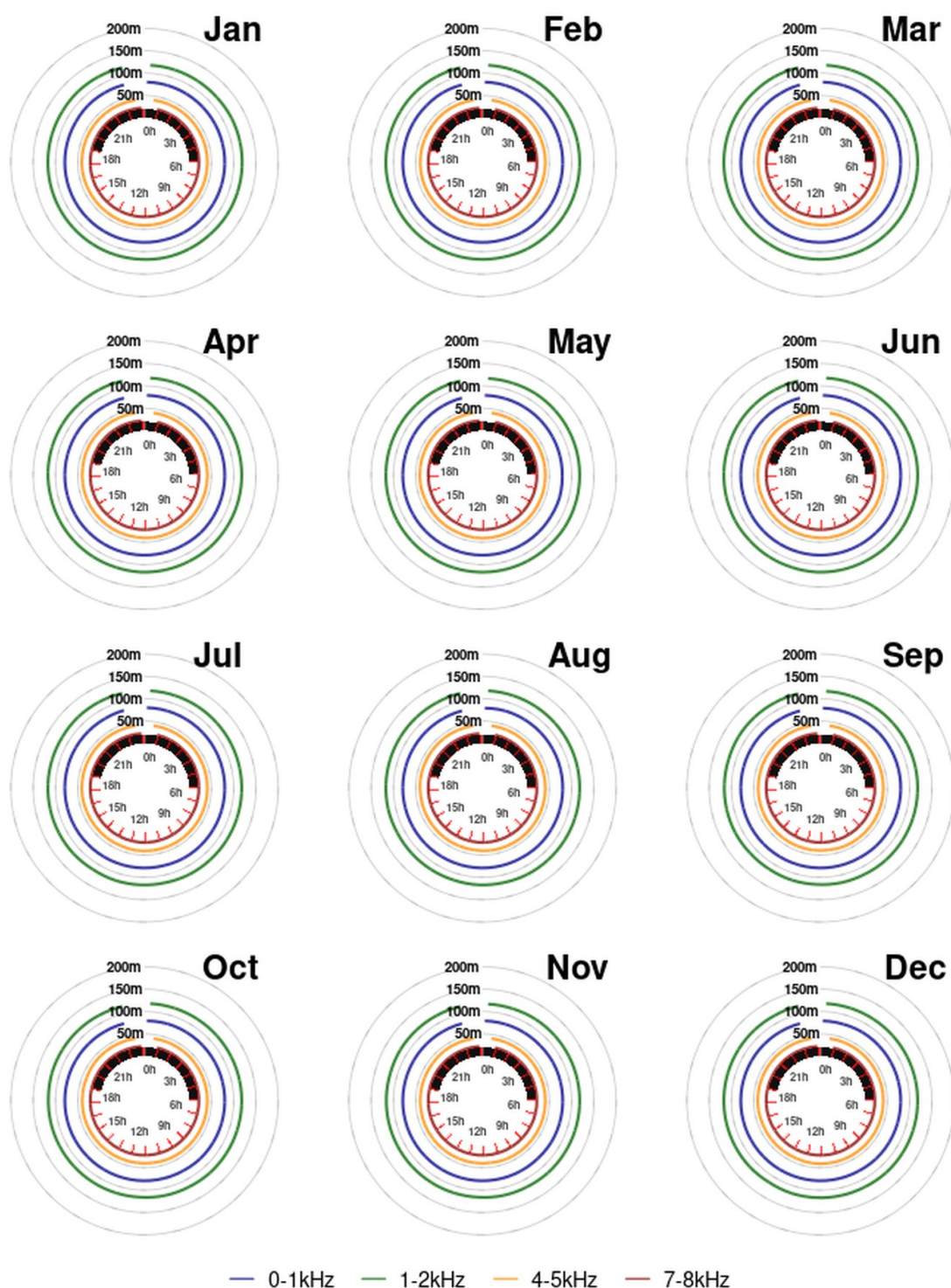


Figure J-2 : Detection distance variation of the ARU according to night and day cycle and month in a Neotropical rainforest (French Guiana) taken into account the variation of the environmental factors ($T^{\circ}\text{C}$ and RH). The sound source was a wideband (0–20 kHz) white noise broadcast at 80 dB SPL re20 μPa at 1 m. Each circular plot represents one month, with each circle corresponding to a propagation distance from 50 to 200 m by a step of 50 m over a complete day (white) and night (black) cycle. Line colours refer to four 1 kHz frequency bands (0–1 kHz, 1–2 kHz, 4–5 kHz, 7–8 kHz). The ambient sound level L_n is fixed to the average yearly value for each frequency bins and hours of the day