

| ITD           | Bandwidth         | Percept | Lateralization of brain responses   |   |
|---------------|-------------------|---------|---|---|
|               |                   |         | Weighted-image model  | $\pi$ -limit model  |
| -500 $\mu$ s  | 50 Hz<br>(narrow) | left    | right   | right   |
| -1500 $\mu$ s | 50 Hz<br>(narrow) | right   | left (because of more ITD detectors at +500 $\mu$ s than at -1500 $\mu$ s)        | left (because of ITD detectors at +500 $\mu$ s but none at -1500 $\mu$ s) |
| -500 $\mu$ s  | 500 Hz<br>(broad) | left    | right   | right   |
| -1500 $\mu$ s | 500 Hz<br>(broad) | left    | right (because of straightness weighting operating on the -1500 $\mu$ s channels) | left (because of ITD detectors at +500 $\mu$ s but none at -1500 $\mu$ s) |

**Supplementary Table 1**