

Figure 1: Directivity maps simulated with VocalTractLab3D with the plane mode only and all the higher order modes up to 40 kHz and measured on the head and torso simulator equipped with the vocal tract replicas of /a/, /i/ and /u/ of the participant 2 without lips and without torso in the horizontal plane.

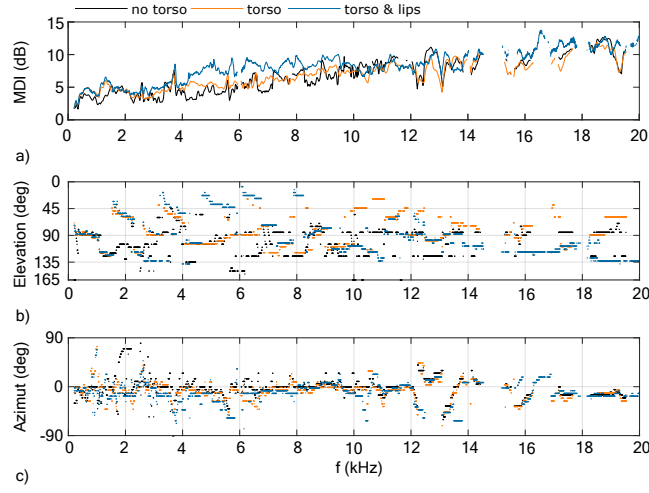


Figure 2: Modified directivity index, elevation and azimuth of the maximum of amplitude for the vowel /a/ of participant 1 with and without lips and with and without torso. The angles of the different configurations are shifted by 1° to make them differentiable.

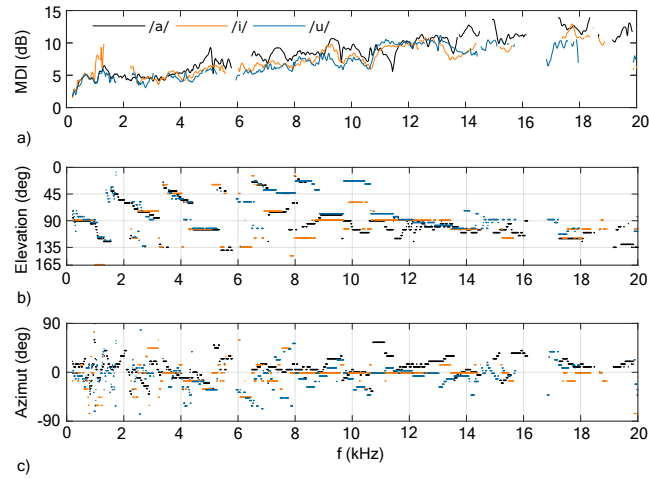


Figure 3: Modified directivity index, elevation and azimuth of the maximum of amplitude for the vowels /a/, /i/ and /u/ of the participant 2 with torso and lips. The angles of the different configurations are shifted by 1° to make them differentiable.

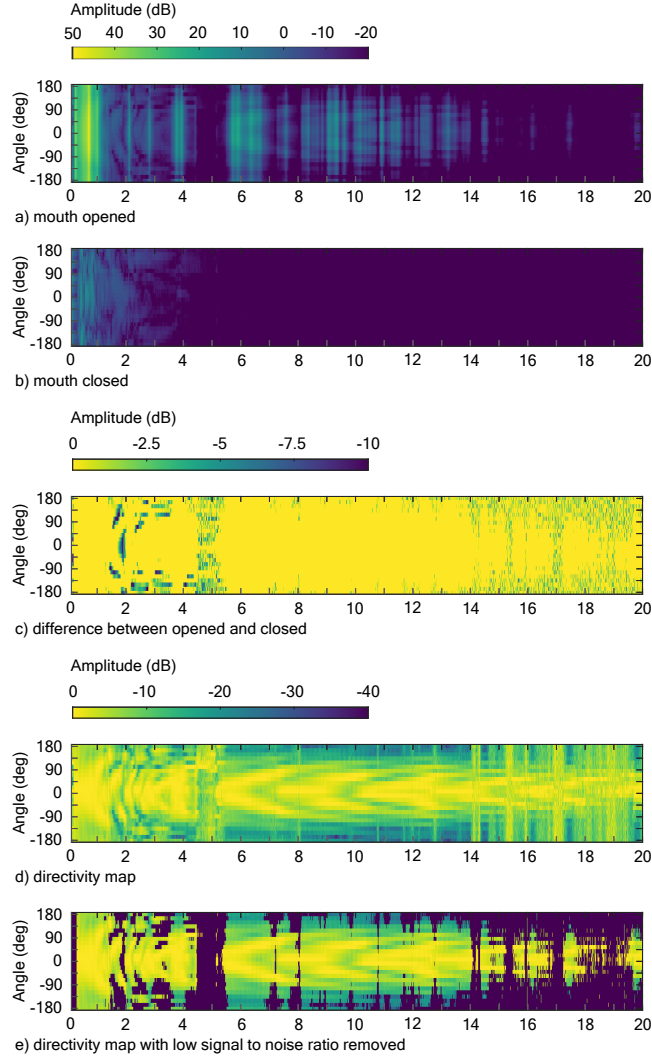


Figure 4: Measurement of the vocal tract replica of /u/ of the participant 1 with the torso, without lips and with the mouth opened or closed with modelling clay. This was done to investigate the contribution of secondary paths to the overall radiation. (a) amplitude map with the mouth opened, (b) amplitude map with the mouth closed, (c) difference of amplitude between the mouth opened and closed configuration, with a colormap range emphasizing the cases in which the closed mouth configuration radiates a higher level than the mouth opened configuration (d) directivity map of the mouth opened configuration (e) directivity map of the mouth opened configuration with the data under the noise threshold excluded.

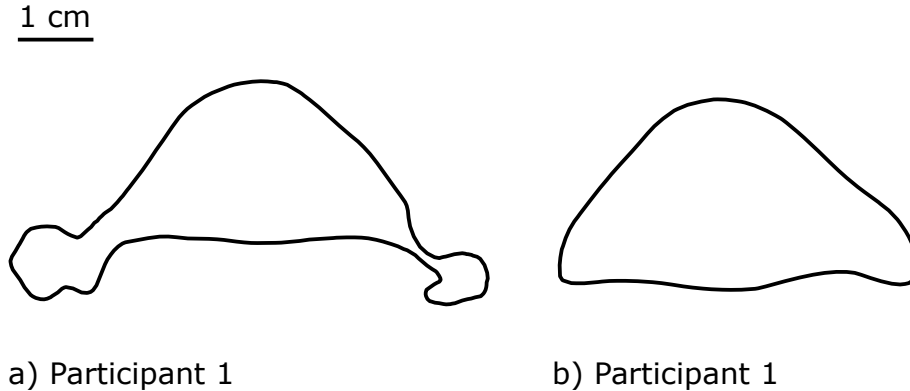


Figure 5: Transverse cut of the oral cavity of the participants pronouncing the vowel /a/.