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KEMAR HATS Head Orientation Directivity

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Overview

The KEMAR head orientations directivity data set consists of full spherical directivity measurements of a KEMAR HATS with the head oriented at fourteen different head orientations measured with a $a = 0.97$m array. The sampling density is based on a dual-equiangular sampling consistent with the AES 5° sampling standard, with the omission of the south pole ($\theta = 180°$) measurement. Thus, each spherical directivity has 36 polar angle θ samples and 72 azimuthal angle ϕ samples. The data is presented for 22 1/3rd octave bands, ranging from 80 Hz to 10 kHz. The fourteen head orientations are in 5° steps starting from 0° to 40°, and then in 10° steps from 40° to 90°. In addition, far-field corrections based on narrowband spherical harmonic expansions are available for the 500 Hz and below 1/3rd octave bands.

The data is currently available in two formats. The first is tabulated data saved in the files *KEMAR_head_orientation_directivity.csv* and *KEMAR_head_orientation_directivity_ff_corrections.csv*, with the former containing the data with no far-field corrections and the latter containing the data with far-field corrections. The tabulated values are based on re-sampling the directivities in a *rotated* configuration, as many architectural acoustics packages expect that the north pole measurement ($\theta = 0°$) is the on-axis position. See Fig. 1 for a visualization of the different sampling configurations.

The second file format is a *.mat* file, *data.mat*, which contains the following fields:

- Q: $(36 \times 72 \times 22 \times 14)$ directivity factor function of measured data

- Qc: $(36 \times 72 \times 22 \times 14)$ directivity factor function of measured data with far-field corrections

- polar: (36×72) polar sampling positions (in radians)

- azimuth: (36×72) azimuthal sampling positions (in radians)

- f: (22×1) 1/3rd octave bands

- orientations: (14×1) head orientation angles (in degrees)

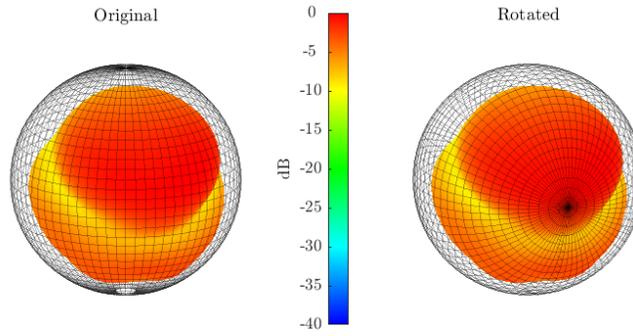The *.mat* file is based on the *original* sampling configuration.

Figure 1: Illustration of original and rotated sampling configuration.