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## KEMAR HATS Head Orientation Directivity

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# KEMAR HATS Head Orientation Directivity Data Set

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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  $a = 0.97\text{m}$  array. The sampling density is based on a dual-equiangular sampling consistent with the AES  $5^\circ$  sampling standard, with the omission of the south pole ( $\theta = 180^\circ$ ) measurement. Thus, each spherical directivity has 36 polar angle  $\theta$  samples and 72 azimuthal angle  $\phi$  samples. The data is presented for 22 1/3rd octave bands, ranging from 80 Hz to 10 kHz. The fourteen head orientations are in  $5^\circ$  steps starting from  $0^\circ$  to  $40^\circ$ , and then in  $10^\circ$  steps from  $40^\circ$  to  $90^\circ$ . 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 ( $\theta = 0^\circ$ ) 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:  $(36 \times 72)$  polar sampling positions (in radians)
- azimuth:  $(36 \times 72)$  azimuthal sampling positions (in radians)
- f:  $(22 \times 1)$  1/3rd octave bands

- orientations:  $(14 \times 1)$  head orientation angles (in degrees)

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

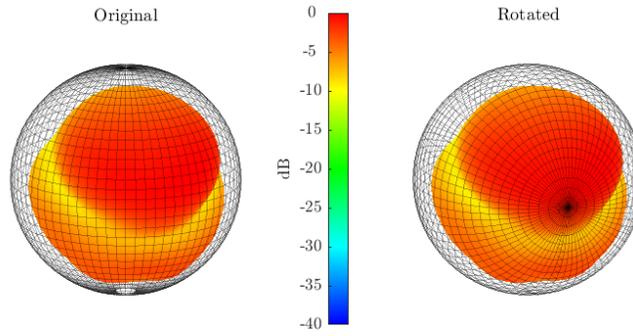


Figure 1: Illustration of original and rotated sampling configuration.