

BSc Audiology & MSc Audiological Science

AUDL 4007: Auditory Perception

Laboratory session on notch noise masking

Introduction

A popular way to estimate auditory filter shapes is based on the technique of notch noise masking. Here, the threshold of a sinusoidal probe tone is determined for a number of flat-spectrum noises that differ only in the width and position of a spectral notch. In this lab, you will measure your threshold for a 2 kHz sinusoid for 4 different notch conditions. One of these is a no-notch condition, hence a band of noise spanning 400-3600 Hz. The three others all have symmetric notches:

Condition	g	low band edge	low notch edge	high notch edge	high band edge	threshold (stimulus number)	threshold (SNR dB)
<i>no notch</i>	0.0	400	-	-	3600		
	0.1	400	1800	2200	3600		
	0.2	400	1600	2400	3600		
	0.3	400	1400	2600	3600		

Method

You will be using an adaptive technique in a three-interval, three-alternative forced-choice (3I-3AFC) format as implemented in a computer program known as *Glimpse*. Select a notch condition by choosing one of the following specification files: TriplesNotch0.txt, TriplesNotch1.txt, TriplesNotch2.txt or TriplesNotch3.txt. The digit indicates the g value of the particular notch condition. A fuller description of Glimpse can be found at:

<http://www.phon.ucl.ac.uk/courses/spsci/audper/HelpGlimpseNotch.htm>

Observations

Run yourself on all 4 conditions in whatever order you like. You can then use the 'Toggle Data' option to inspect the results. This will show you both the adaptive track as well as summary statistics. Your threshold will be expressed in terms of an arbitrary number of a stimulus along the continuum (from 1-69), which you can enter in the table above. To calculate the signal-to-noise ratio (SNR) of the tone that you could just detect, subtract 31 from the stimulus number. Plot your SNR as a function of g , the normalised notch width:

$$g = |(f - f_c)|/f_c$$

where f is the frequency of the notch edge, and f_c is the frequency of the probe, or the centre frequency of the filter being measured.

Your results files can be independently accessed by a shortcut in the lab folder. Take one of your results files, and construct a psychometric function from it using Excel. Estimate the 80% point on this curve. How does it compare to the threshold given by Glimpse and the adaptive track?