

# Active Noise Control of Speech in Headphones

using Linear Prediction

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Acoustics and Audio Technology - Fall 2016  
Department of Electronic Systems  
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Denmark



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# Agenda

Active Noise Control of  
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Group 761

## Introduction

What is Active Noise  
Control (ANC)

Present consumer  
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## Methods

Adaptive Filtered-x least  
mean squares FIR  
algorithm

Wiener filtering

## Results

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► Counterphase signal

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## Limits of ANC

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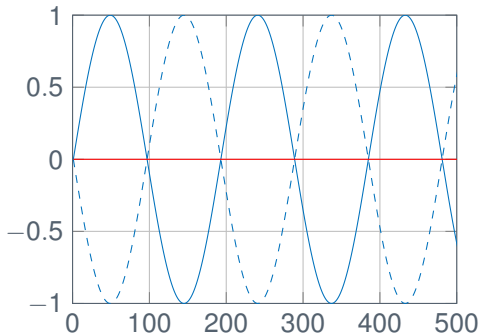
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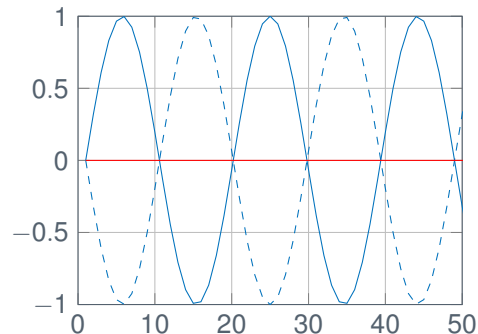
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### ► Frequency dependent attenuation



— Original signal  
- - Counterphase signal  
— Error



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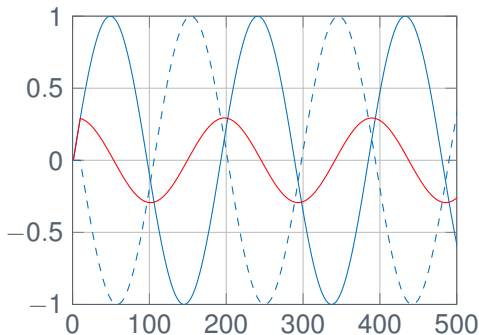
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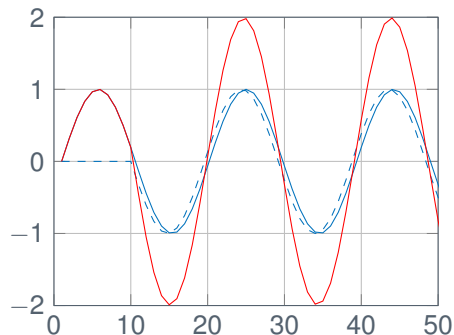
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### ► Frequency dependent attenuation



— Original signal  
-- Counterphase signal  
— Error





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## Problem with ANC

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► Conversion delay

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## Present consumer headphones

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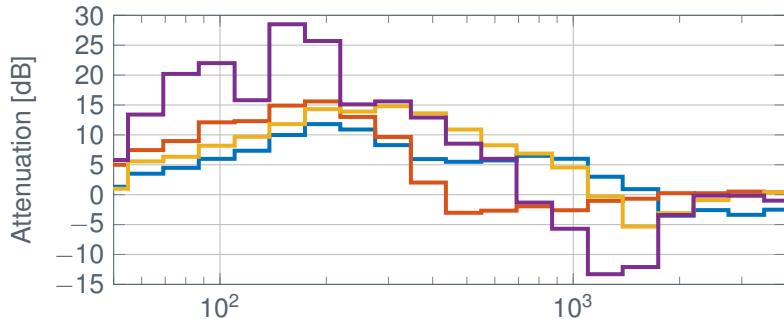
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### ► How well does the consumer headphones attenuate?

- Denon AH-GC20 2.200 kr (2016)
- Bose QC25 2.799 kr (2016)
- Bose QC15 2.696 kr (2011)
- B&O H8 3.495 kr (2016)





# Opbygning

## Decimator

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