

## Introduction

### Clinical background

- Hearing impaired have difficulty understanding speech in noisy environments
- Technical properties of noise reduction differ largely between hearing aids
- Principles of the applied noise reduction in hearing aids are unknown to the clinicians
- Perceptual effects of the differences in noise reduction are as yet unknown

### Goals

- Investigate current benefits and possible future improvements of single channel noise reduction in hearing aids
- Measure perceptual effects of
  - 1) noise reduction implementations in modern hearing aid
  - 2) noise reduction algorithms that are considered state-of-the-art in literature
- Relate current implementations to the state-of-the-art in literature

## Open questions

### Which noise reduction algorithms are considered state-of-the-art in literature?

Matlab implementations from Loizou 2007<sup>1)</sup>:

- Logmmse (Ephraim and Malah 1985<sup>2)</sup>; Cohen 2002<sup>3)</sup>)
- Wiener filter based on a priori SNR estimation (Scalart and Filho 1996<sup>4)</sup>)

### Which current hearing aids are appropriate for this study?

- Requirements: no compression; possibility to turn on/off noise reduction; unity gain
- Proposals: GN ReSound Azure or Phonac Exélia M

### Which outcome measures can detect the relevant perceptual effects?

Intelligibility	Listening comfort	Listening effort
• Fixed SNR: % correct	• Preference: Paired comparisons • Acceptable noise level (ANL)	• Rating scale

## Study design

