Nonlinear time-domain cochlear model for transient stimulation and human otoacoustic emission - DTU Orbit (06/01/2019)

**Nonlinear time-domain cochlear model for transient stimulation and human otoacoustic emission**

This paper describes the implementation and performance of a nonlinear time-domain model of the cochlea for transient stimulation and human otoacoustic emission generation. The nonlinearity simulates compressive growth of measured basilar-membrane impulse responses. The model accounts for reflection and distortion-source otoacoustic emissions (OAEs) and simulates spontaneous OAEs through manipulation of the middle-ear reflectance. The model was calibrated using human psychoacoustical and otoacoustic tuning parameters. It can be used to investigate time-dependent properties of cochlear mechanics and the generator mechanisms of otoacoustic emissions. Furthermore, the model provides a suitable preprocessor for human auditory perception models where realistic cochlear excitation patterns are desired. © 2012 Acoustical Society of America.

**General information**

**State:** Published

**Organisations:** Department of Electrical Engineering, Hearing Systems

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**Pages:** 3842-3848

**Publication date:** 2012

**Peer-reviewed:** Yes

**Publication information**

**Journal:** Acoustical Society of America. Journal

**Volume:** 132

**Issue number:** 6

**ISSN (Print):** 0001-4966

**Ratings:**

- BFI (2018): BFI-level 2
- Web of Science (2018): Indexed yes
- BFI (2017): BFI-level 2
- Scopus rating (2017): CiteScore 1.77 SJR 0.695 SNIP 1.224
- Web of Science (2017): Impact factor 1.605
- Web of Science (2017): Indexed yes
- BFI (2016): BFI-level 2
- Scopus rating (2016): CiteScore 1.83 SJR 0.819 SNIP 1.271
- Web of Science (2016): Impact factor 1.547
- Web of Science (2016): Indexed yes
- BFI (2015): BFI-level 2
- Scopus rating (2015): CiteScore 1.77 SJR 0.854 SNIP 1.416
- Web of Science (2015): Impact factor 1.572
- Web of Science (2015): Indexed yes
- BFI (2014): BFI-level 2
- Scopus rating (2014): CiteScore 1.8 SJR 0.887 SNIP 1.402
- Web of Science (2014): Impact factor 1.503
- Web of Science (2014): Indexed yes
- BFI (2013): BFI-level 2
- Scopus rating (2013): CiteScore 2 SJR 0.707 SNIP 1.937
- Web of Science (2013): Impact factor 1.555
- ISI indexed (2013): ISI indexed yes
- Web of Science (2013): Indexed yes
- BFI (2012): BFI-level 2
- Scopus rating (2012): CiteScore 1.75 SJR 0.771 SNIP 1.619
- Web of Science (2012): Impact factor 1.646
- ISI indexed (2012): ISI indexed yes
- Web of Science (2012): Indexed yes
- BFI (2011): BFI-level 2
- Scopus rating (2011): CiteScore 1.68 SJR 0.686 SNIP 1.624
- Web of Science (2011): Impact factor 1.55