
AMERICAN NATIONAL STANDARD

Procedure for Determining Audiograms in Toothed Whales through Evoked Potential Methods

ANSI/ASA S3/SC1.6-2018

Accredited Standards Committee S3/SC 1, Animal Bioacoustics

Standards Secretariat
Acoustical Society of America
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Secretariat:

Acoustical Society of America

Approved on May 31, 2018, by:

American National Standards Institute, Inc.

Abstract

This standard describes measurement procedures for obtaining audiograms in odontocete cetaceans (i.e., toothed whales) via evoked potential methods, specifically by generation of the auditory steady-state response (ASSR). Methods are specified for the use of sinusoidally amplitude-modulated (SAM) tones and trains of tone bursts. It further establishes standards for reporting data collection methods, analyses, and hearing thresholds.

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Foreword

[This Foreword is for information only, and is not a part of the American National Standard ANSI/ASA S3/SC1.6-2018 American National Standard Procedure for Determining Audiograms in Toothed Whales through Evoked Potential Methods. As such, this Foreword may contain material that has not been subjected to public review or a consensus process. In addition, it does not contain requirements necessary for conformance to the standard.]

This standard comprises a part of a group of definitions, standards, and specifications for use in animal bioacoustics. It was developed and approved by Accredited Standards Committee S3/SC 1 Animal Bioacoustics, under its approved operating procedures. Those procedures have been accredited by the American National Standards Institute (ANSI). The Scope of Accredited Standards Committee S3/SC 1 is as follows:

Standards, specifications, methods of measurement and test, instrumentation, and terminology in the field of psychological and physiological acoustics, including aspects of general acoustics which pertain to biological safety, tolerance, and comfort of non-human animals, including both risk to individual animals and to the long-term viability of populations. Animals to be covered may potentially include commercially grown food animals; animals harvested for food in the wild; pets; laboratory animals; exotic species in zoos, oceanaria or aquariums; or free-ranging wild animals.

This standard is not comparable to any existing ISO Standard.

At the time this Standard was submitted to Accredited Standards Committee S3/SC 1, Animal Bioacoustics, for approval the membership was as follows:

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Introduction

This standard establishes procedures for estimating frequency-specific hearing thresholds in odontocetes (toothed whales) through the use of auditory evoked potential (AEP) methods. The objective of the standard is to provide consistent guidelines for the collection of audiograms. The rapid proliferation of AEP hearing tests in odontocetes has been accompanied by varied ways of calibrating test stimuli and calculating hearing thresholds with resulting wide variances in threshold estimates across laboratories for the same species and frequencies tested. The variability has introduced confusion into stakeholder communities that utilize marine mammal hearing thresholds both in academic contexts, and to predict, mitigate, and regulate the potential impact of sound on marine mammals. This standard establishes consistent test methods and quantities to report so better comparability in odontocete AEP threshold estimates can be achieved.

The use of the auditory steady-state response (ASSR) is recommended for obtaining frequency-specific thresholds due to the high amplitude modulation rates that are available for odontocetes, its ease of analysis in the frequency domain, its common usage, and its amenability to objective statistical response detection methods.