

aacPlus

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MPEG-4 HE AAC = aacPlus = AAC+

Technology Overview

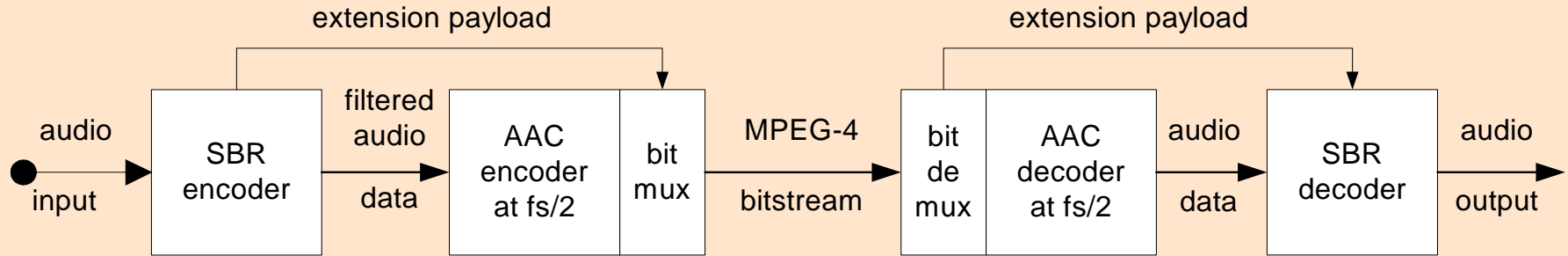
Technology Overview

- aacPlus is the latest development in audio coding technology and within MPEG, based on state of the art AAC
- aacPlus combines two tools, today's most efficient perceptual audio coder (MPEG AAC) and the new tool MPEG SBR
- Each tool works in the area where it is best suited
 - AAC in the lower frequency bands
 - SBR in the upper frequency bands

Technology Overview

- The result is a efficiency gain of 30% compared to AAC only encoding and a high quality 5.1 multichannel signal at 160 kbps
- Two versions of SBR are defined – a High Quality and a Low Power version
- Parametric Stereo was recently added to the MPEG standard as a new tool to improve the audio quality at the lowest bit rates
- Both specifications are available from ISO

Combining AAC and SBR to aacPlus



aacPlus & AAC are twins

- aacPlus is a superset of the AAC-LC profile
 - Every aacPlus encoder can generate aacPlus and AAC bit streams
 - Every aacPlus decoder can decode aacPlus and AAC bitstreams
 - Every AAC decoder can decode the AAC part of a aacPlus bitstream

aacPlus & AAC are twins

- aacPlus and AAC are using the same bit stream syntax
- ⇒ aacPlus can easily be integrated into existing systems which are already using AAC
- ⇒ Service operators can pick the optimum bit rate and sampling frequency for their service

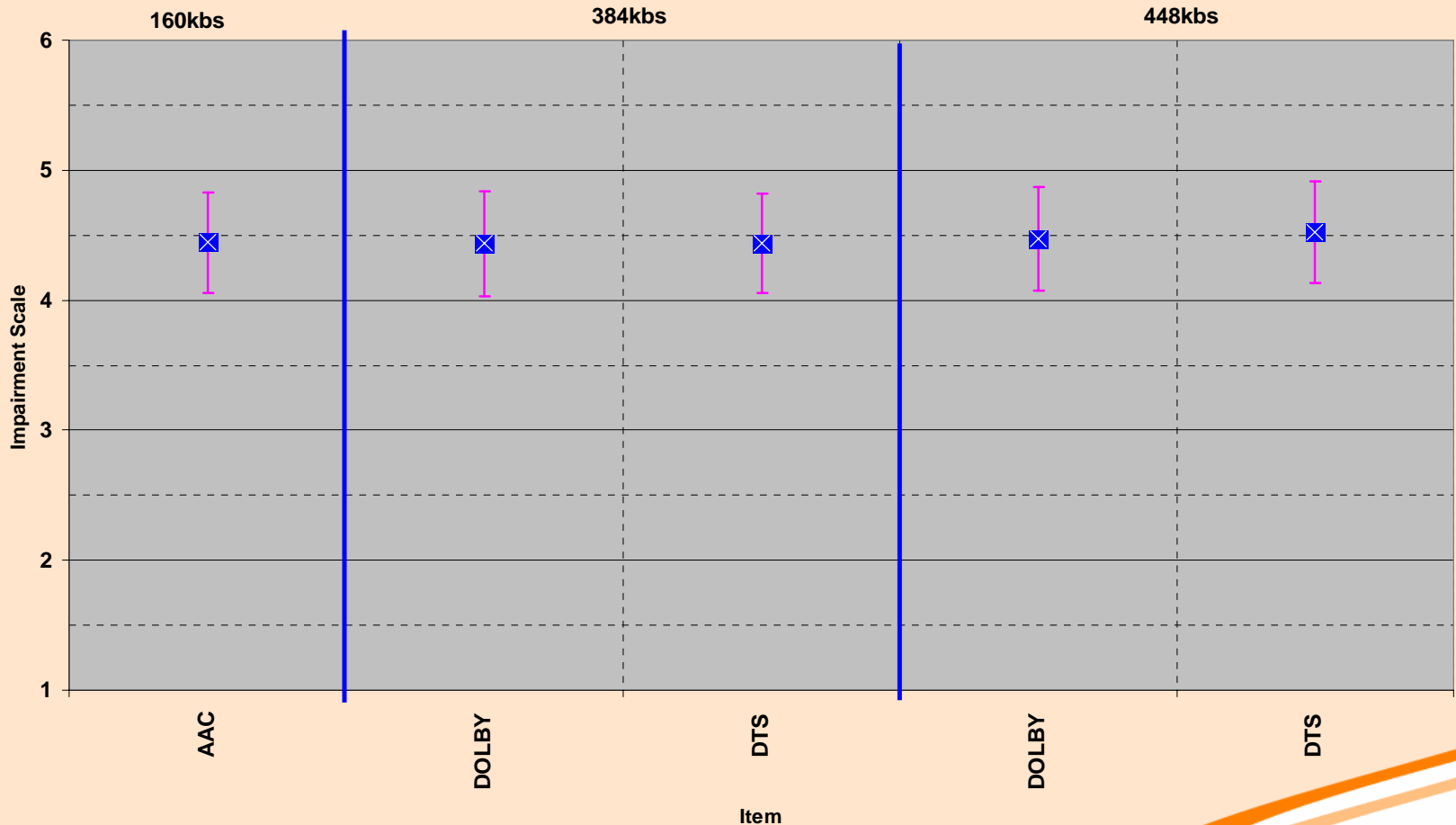
Test Results for aacPlus

Multi-Channel Audio Tests @ IRT'03: Codecs under Test

- aacPlus, 160 kbit/s
 - Encoder and Decoder in Software (Non-Realtime) delivered to IRT
- Dolby Digital, 384 kbit/s and 448 kbit/s
 - Realtime MC Audio Encoder: DP569 Vers. 05/03
 - Realtime MC Audio Decoder: DP562
 - both available at IRT
- DTS, 384 kbit/s, 448 kbit/s
 - Non-realtime software encoder and decoder.
 - Encoding and decoding performed at DTS

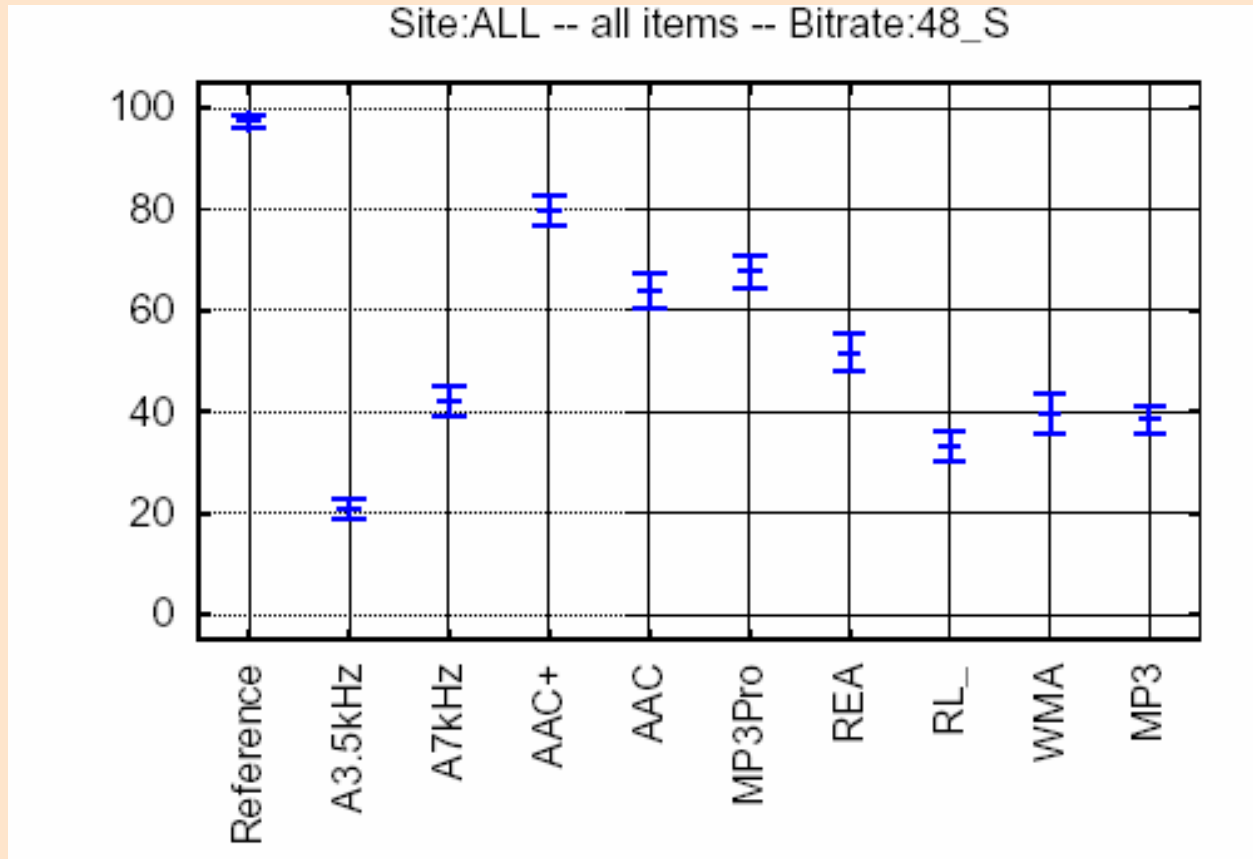
Multi-Channel Audio Tests @ IRT in 2003: Mean values for different MC codecs

Mittelwerte & 95%-VB



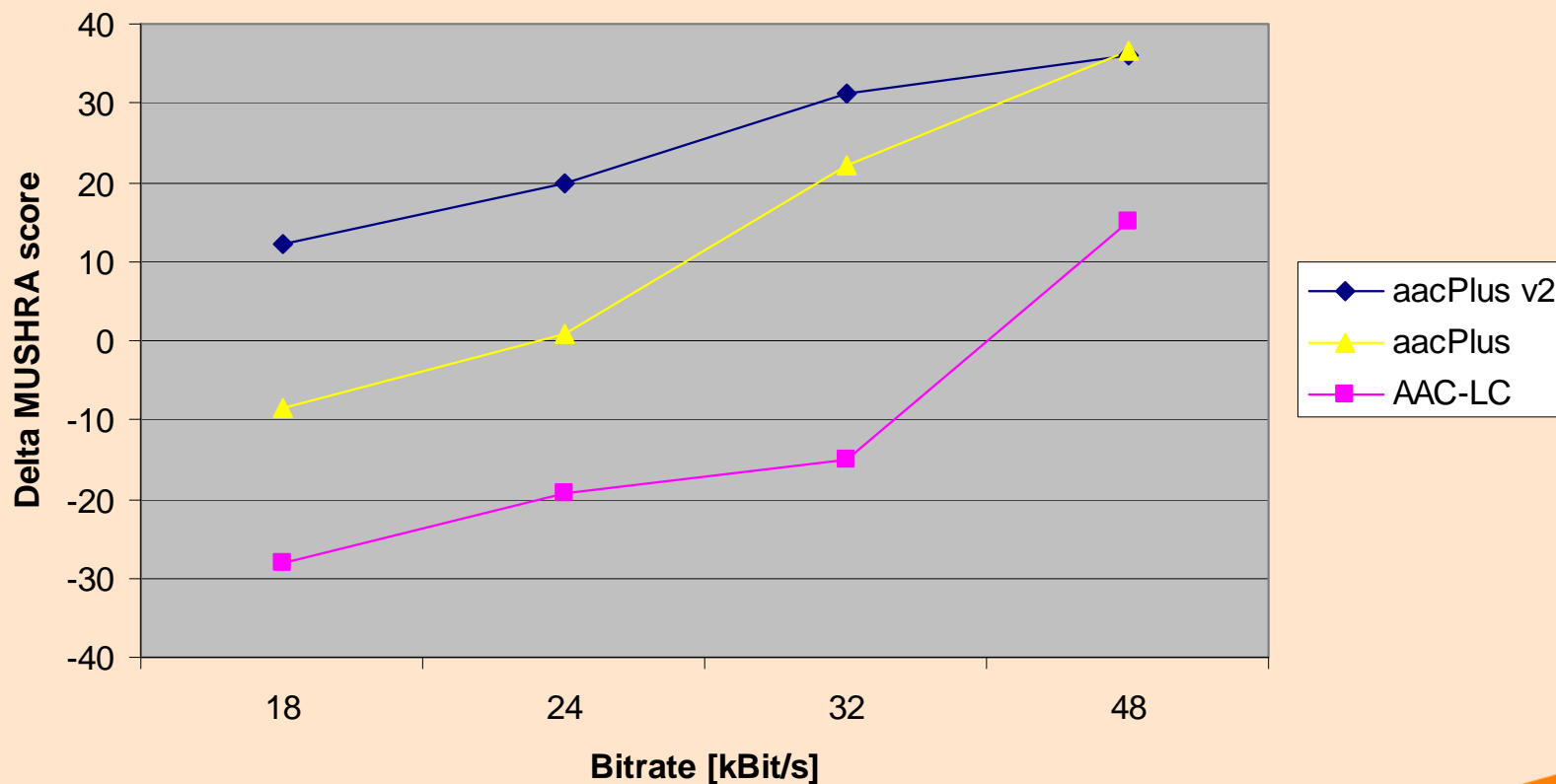
Results from 13 subjects.

aacPlus Test Results -EBU Test at 48 kbps stereo



Results of the 3GPP test

MUSHRA scores relative to 7kHz anchor, stereo



aacPlus in other Standards and Applications

aacPlus in other Standards

- DVB specified the use of aacPlus for transmission over IP (e.g. DVB-H)
- Digital Radio Mondiale uses aacPlus
- DVD Forum as mandatory codec for the compressed audio zone of the DVD Audio and optional codec for DVD-A/R
- Organizations considering the use of aacPlus
 - 3GPP and 3GPP2 for mobile multimedia services (aacPlus v2)
 - DVB for broadcasting applications

aacPlus in Applications

- **XM Satellite Radio** uses an early version of aacPlus as audio coding schemes
 - Enables the transmission of 101 audio services
 - Over 2.3 million subscribers since service launch in Nov. 2001
 - Over 3 million chipset already delivered by STMicroelectronics
- **Real Networks** integrate aacPlus into the Real 10 player
- **AOL** added aacPlus to the WinAmp player for streaming
- Music download services for mobile phones
 - **O2** started service in the UK in 11/03 and in Germany 03/04
 - **Vodafone Germany** launched their service in March 2004
 - **Qualcom** announced in March 04 the support of aacPlus in their latest generation of chipsets for mobile phones
 - **SKTelecom**, Korea, announced to upgrade their existing service from AAC to aacPlus

Audio Demo

Summary of Benefits

- ❑ aacPlus provides a high flexibility to fit for a lot of different applications
- ❑ Content industry can pick optimum bit rate and audio quality for their respective applications
- ❑ aacPlus supports downmix and meta data
- ❑ aacPlus is an open standard and already adopted in a number of applications
- ❑ aacPlus licensing conditions are public available at <http://www.vialicensing.com>

Thank you for your attention !