

Sound

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How to use it in MMS

- Background sound – be careful
- Speech – professional speaker
- Inform about action
 - Click on button
 - New slide
 - ...

How to represent

- Audio track
- MIDI

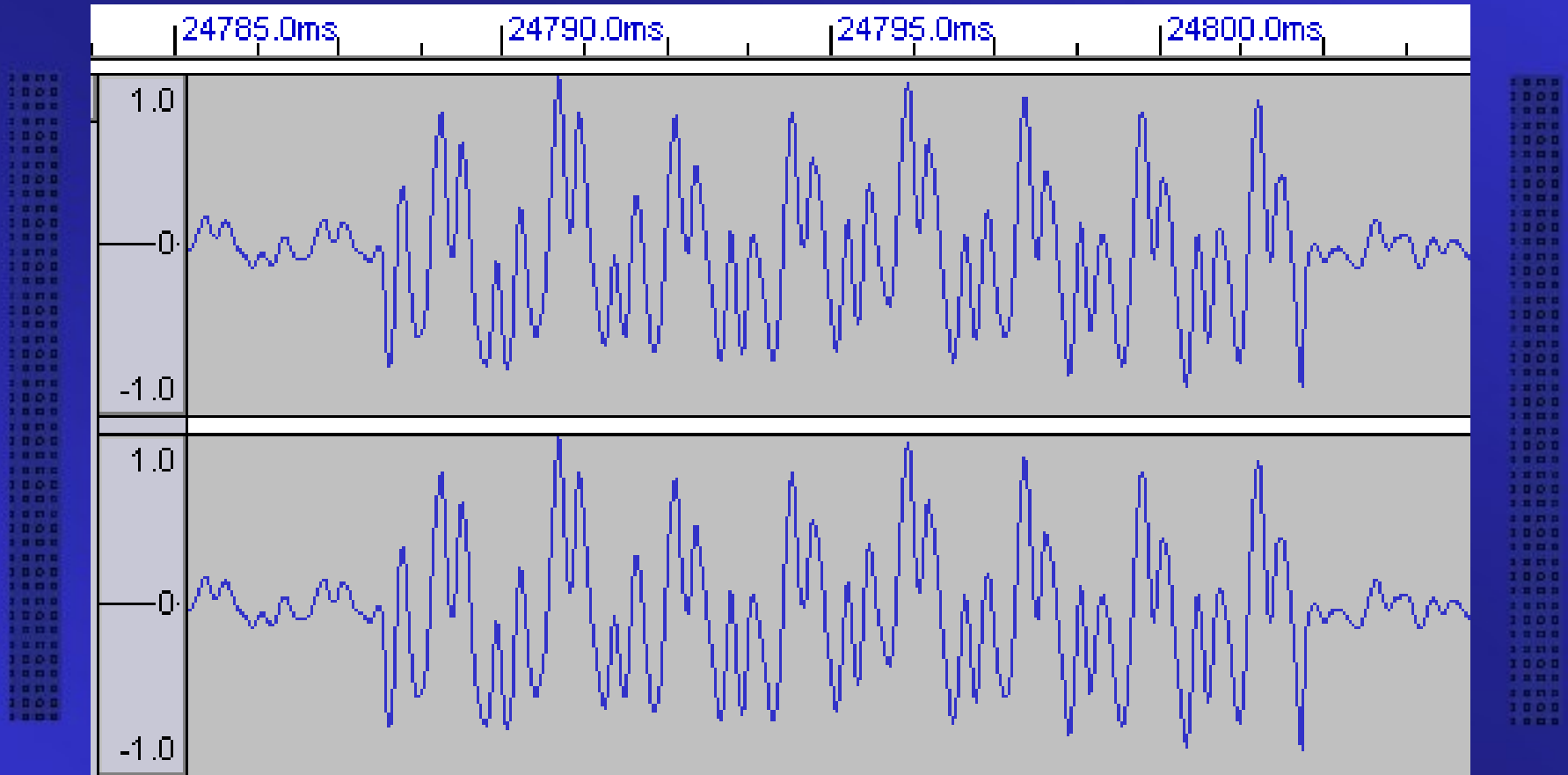
Audio track

- Not compressed
- Compressed

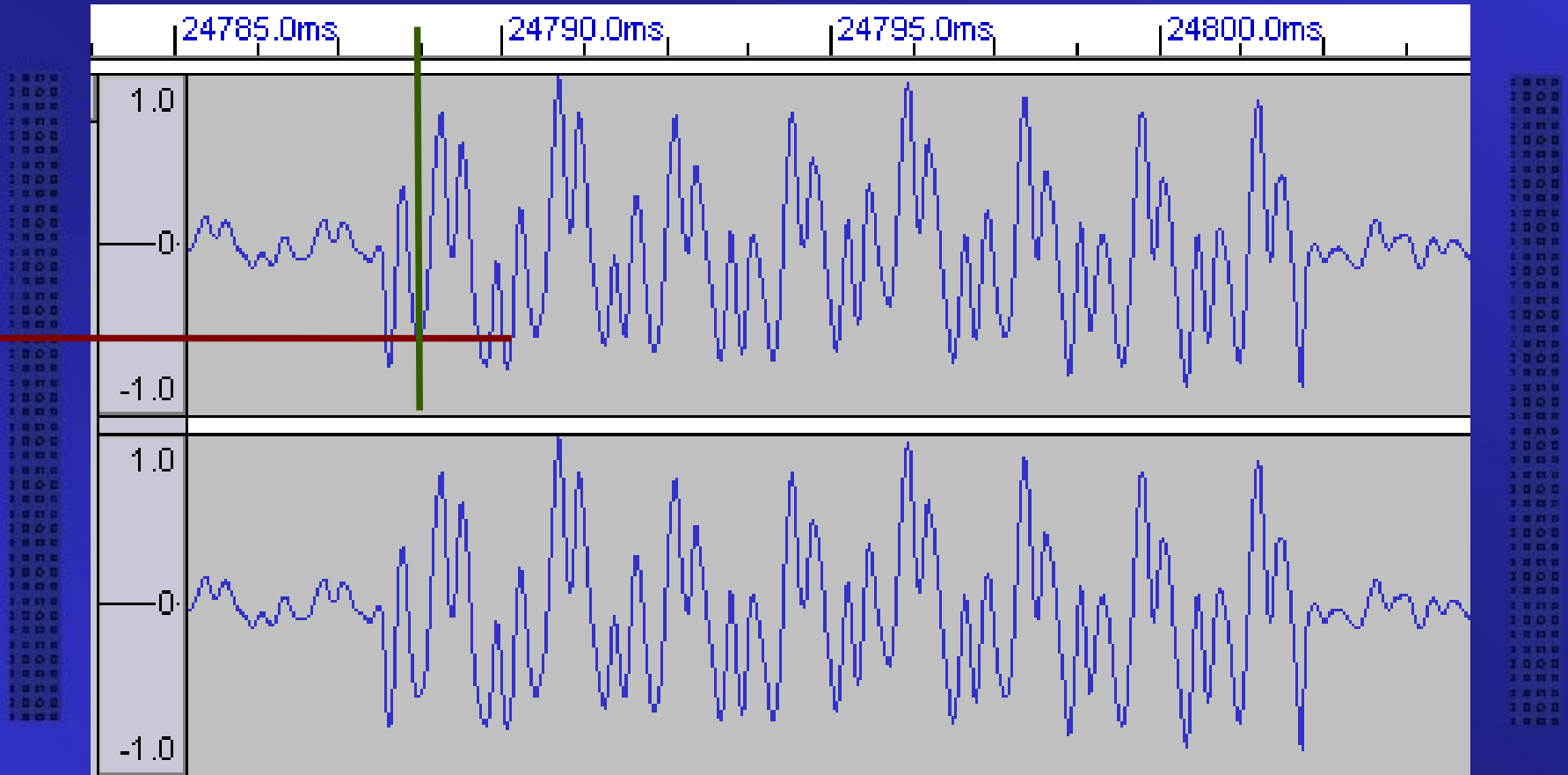
PCM

- Pulse Code Modulation
- Basic method how to sample the sound

PCM / 2



PCM / 3



PCM / 4

PCM / 5

- Sample Rate – Hz, 44.1 kHz
- Word length – bits, 8, 16, ...

Compression - basics

- Standard Compression Techniques – e.g. Huffman coding
- Psychoacoustic effect
 - Frequency masking
 - Temporal masking
- Mathematical description

CODEC

- CCompression
- DECompression
- Algorithm
- Tool (software component)

CODEC - Examples

- MPEG-3 (MP3)
- OGG Vorbis
- AC3 – for spatial sound, used in DVD
- WMA
- AAC – Advanced Audio Coding

Formats

- Compressed
 - MP3
 - OGG
 - WMA
- Not compressed
 - AU
 - WAV

Playing

- Player + CODEC
- Plenty of them: Winamp, Freeamp, Sonique, XMMS, ...

Audio sources

- Microphone
- Digital record
- Analog record
- MIDI

A/D conversion

- Sound Card
- Software
- D/A conversion

Audio cutting

- Linear
- Non-linear

Software tools / 1

- A/D conversion
- Open stream - CODEC
- Save stream – CODEC
- Join streams, overlay (transition) between streams
- Cutting – cut, copy, paste, move

Software tools / 2

- Filters – noise, amplify, fade in, fade out, ...
- Generate – noise, silence, ...
- Bit rate

Bit rate

- CBR – Constant bit rate
- VBR – Variable bit rate
- 128 kbps
- 192 kbps
- ...

Software

- Audacity (<http://audacity.sourceforge.net>)
- ...

Audio in Video Editing

- Save track
- Add track
- Some filters
- Coding
- Synchronize