

Houston, we have a **loudness** problem!

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EBU group P/Loud?



Florian Camerer (ORF) and 152 other audio nuts - trying to get 'home'.

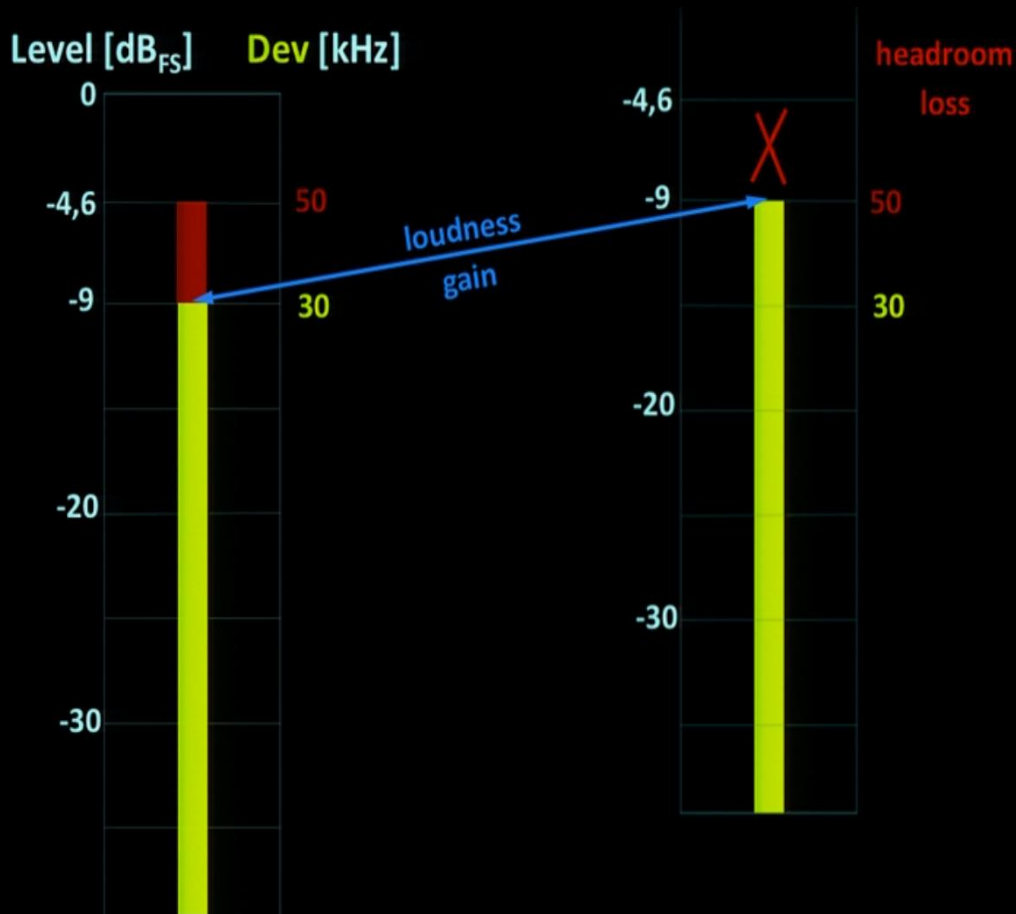
'Home' is a world where there are no loudness jumps, and no need to keep adjusting remote controls...

The past was the age in Europe of the
QPPM (Quasi Peak Programme Meter)

reaction time =10mS

The old Leveling Paradigm

Now gone with the wind...



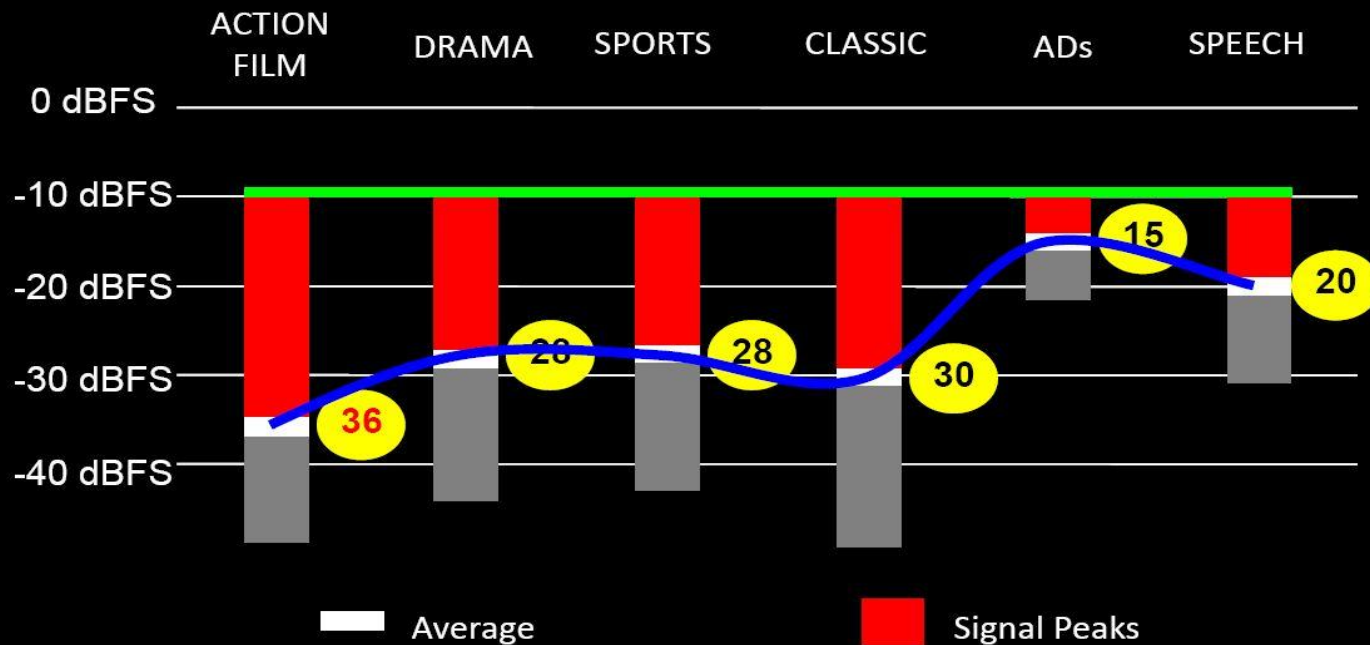
The old world allowed headroom above Quasi-Peak.

Over time the headroom was ignored.

The Loudness war began.

Using a QPPM and normalizing cannot work well

Peak normalizing (QPPM!)



We needed to make a better
meter...

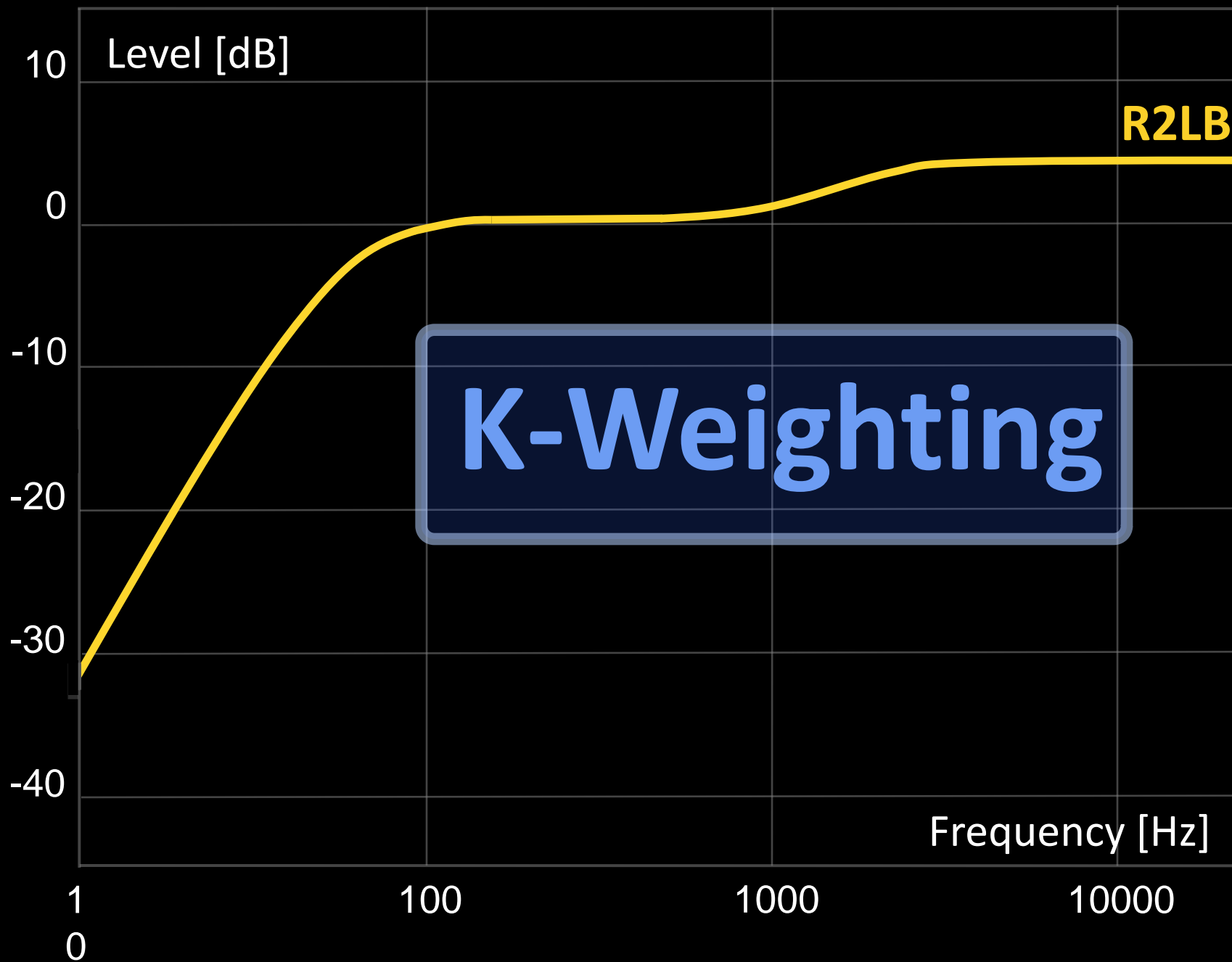


Can a meter read **subjective** audio quality rather than signal level?

Studies in WBU with much work in Canada (listening tests not done by moose)

ITU-R now recommends a meter
which is reasonably good:

ITU-R BS 1770



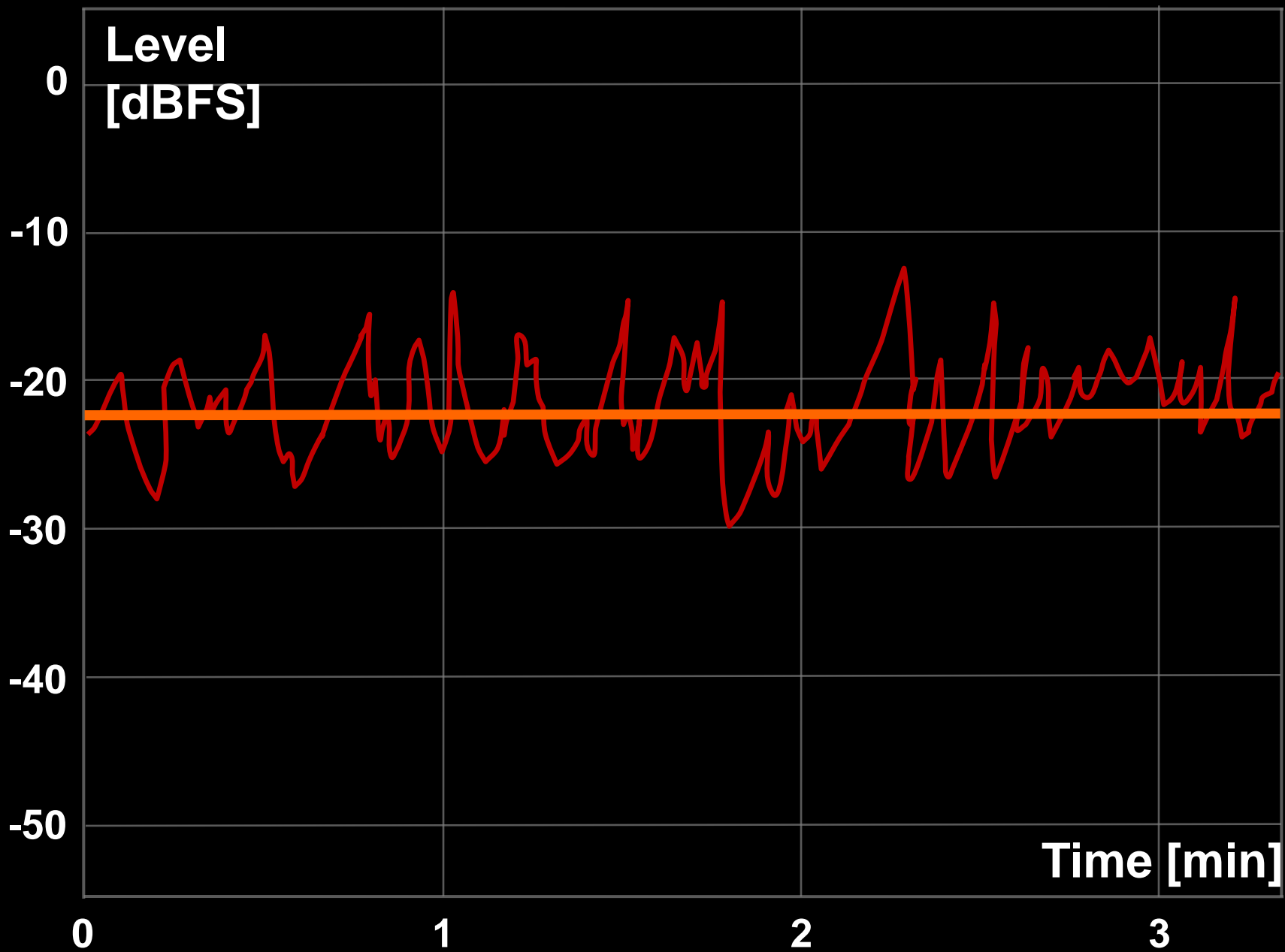
New Loudness Measures

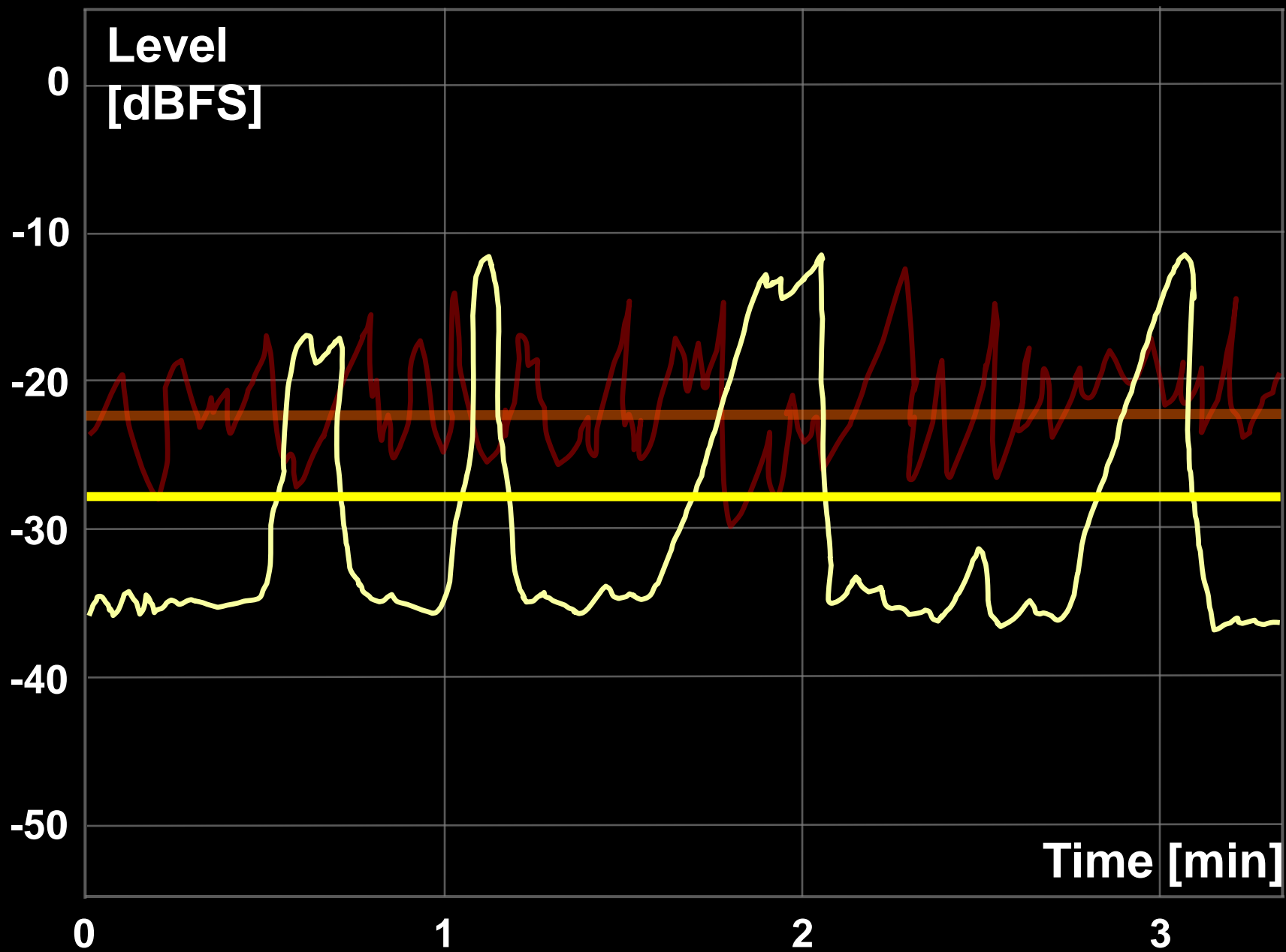
- **Loudness** K-Weighting Full Scale (LKFS)
- LKFS = absolute measure
- Loudness Unit (LU) = relative
- 1 LU equals 1dB
- Measure '**True Peak**' not 'Quasi Peak'
- Use 'Oversampling True Peak Meter'

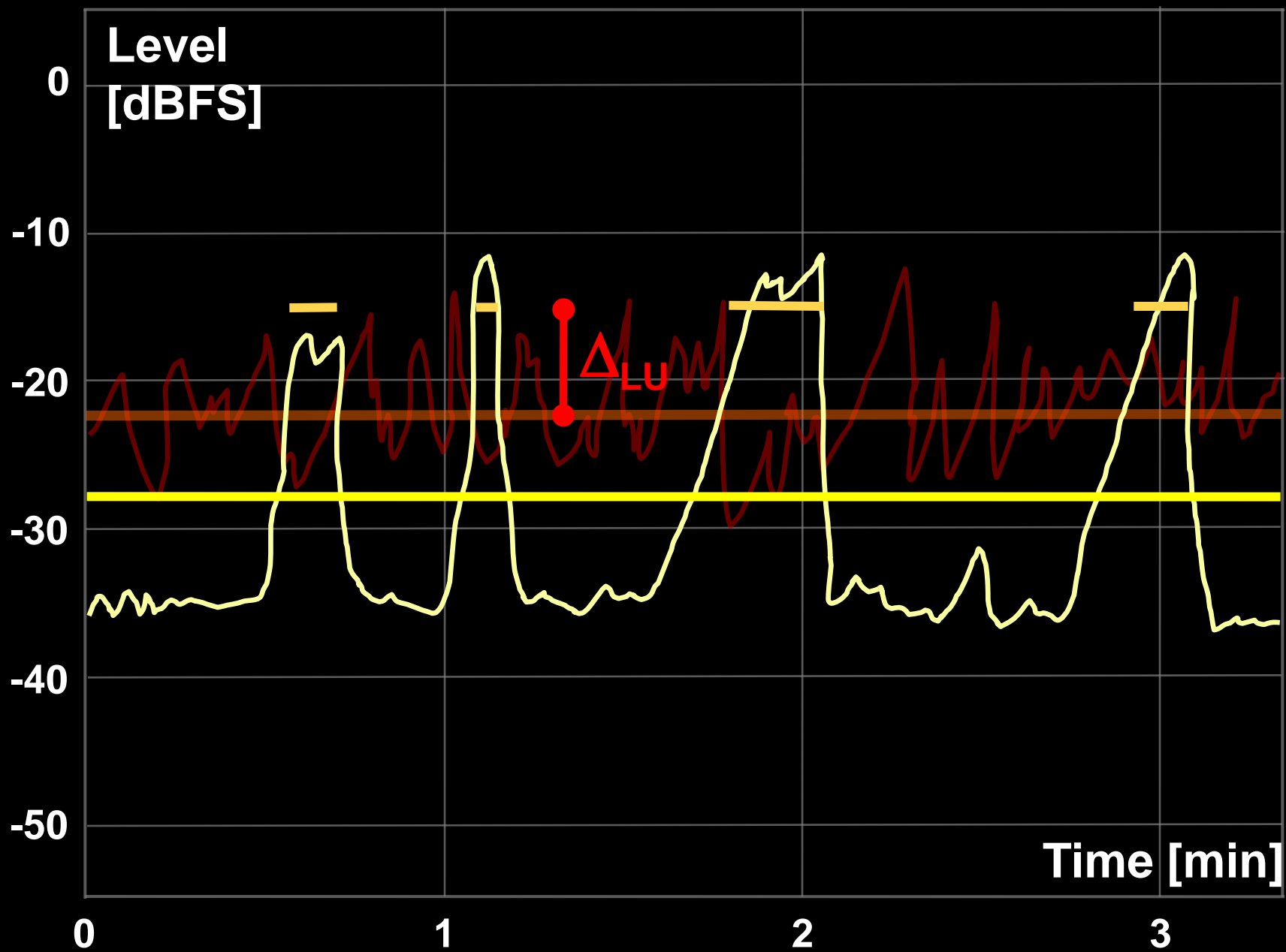
We have the bricks.
Now we can build the house.

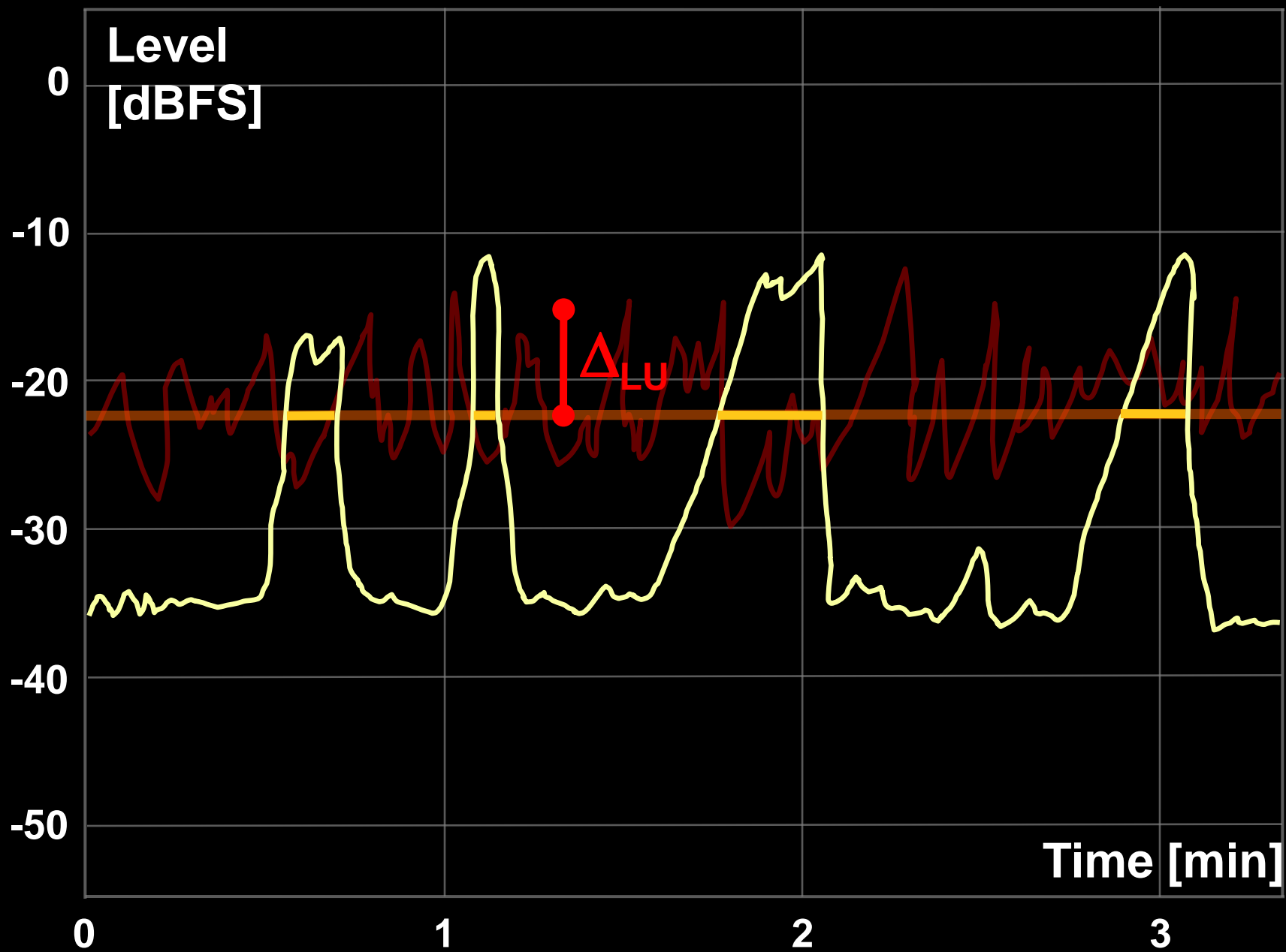
'Gating'

The concept of '**foreground**' loudness,
and the need to cope with it.









P/Loud **Listening Tests** to define Gating

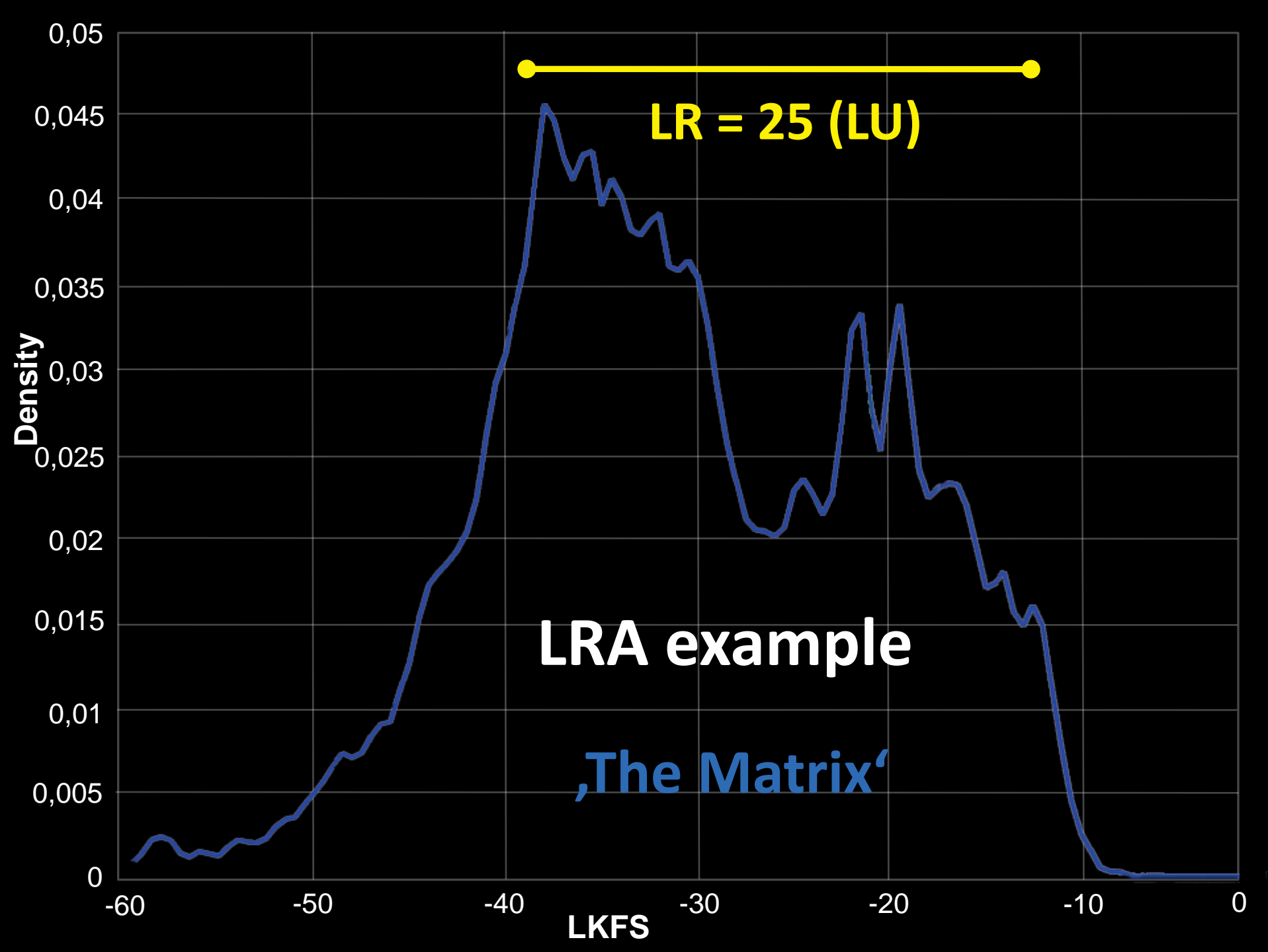
- Four gating levels tested
- -6 LU relative
- -6 LU iterative (closer and closer to the target)
- -10 LU relative
- -20 LU relative
- Probably best were -6 LU relative and -10 LU relative
- but more work still to be done on statistics
- For time being, assumption is that gating should be done at -8 LU below un-gated (400mS block length)

Loudness Meters

- Plan is that Loudness meters will have an 'EBU Mode'.
- Always the same with different manufacturers.
- suggest ITU switch from 'LKFS' to 'LUFS'.
- **Time constants** will be:
 - **Momentary** (400mS)
 - **Sliding Window** (3s)
 - **Integrated** (from start to stop). This is the one gated.

Loudness Range (LRA)

- Guide to prospective difficulties/quality of a programme.
- Derived from the statistical distribution of loudness.
- Extremes of distribution are excluded. Lowest 10% and Highest 5% excluded.



LRA issues

- Do I have to do something (modify) with the LRA to make it suitable for the delivery environment intended?
- Should there be guidelines for different listening environments?

Distribution and Delivery Guidelines

Take into account all the different set top
boxes and different output modes

EA, EBU minimum guidelines for HDTV
receivers (Tech Doc 3333)

'Content Supply-side' Guidelines

Migration scenarios (can be a toughy)?

Implementation scenarios?

What do I have to do to change?

Listening conditions do I need?

Main Recommendation R128

Three audio parameters

Programme loudness (-23 LUFS gated, +-1 LU for live programmes)

Maximum true peak (-1 or -2 dBTP)

Loudness range descriptor (use it please)

Where there is metadata, it shall always reflect the correct loudness

Goodbye QPPM 😊

The planned **outputs** from P/Loud?

Recommendation R128

Metering Tech. doc. (EBU mode meter)

Loudness range Tech. doc

Distribution Guidelines Tech. doc

Implementation Guidelines Tech. doc

What more could you want?

Summarizing

We have built on the loudness approach recommended by the ITU-R.

The approach will work much better than QPPM.

The approach should lead to guidelines for Production, Distribution and Delivery.

The approach should lead to **better audio quality** and less frustration for us all.

THANK YOU FOR LISTENING

Presentation pictures mostly stolen from Florian Camerer

