



On air HF XL experimentation results

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HF XL wideband radio communications solution

- ◆ Modem structure
- ◆ Adaptation on the fly

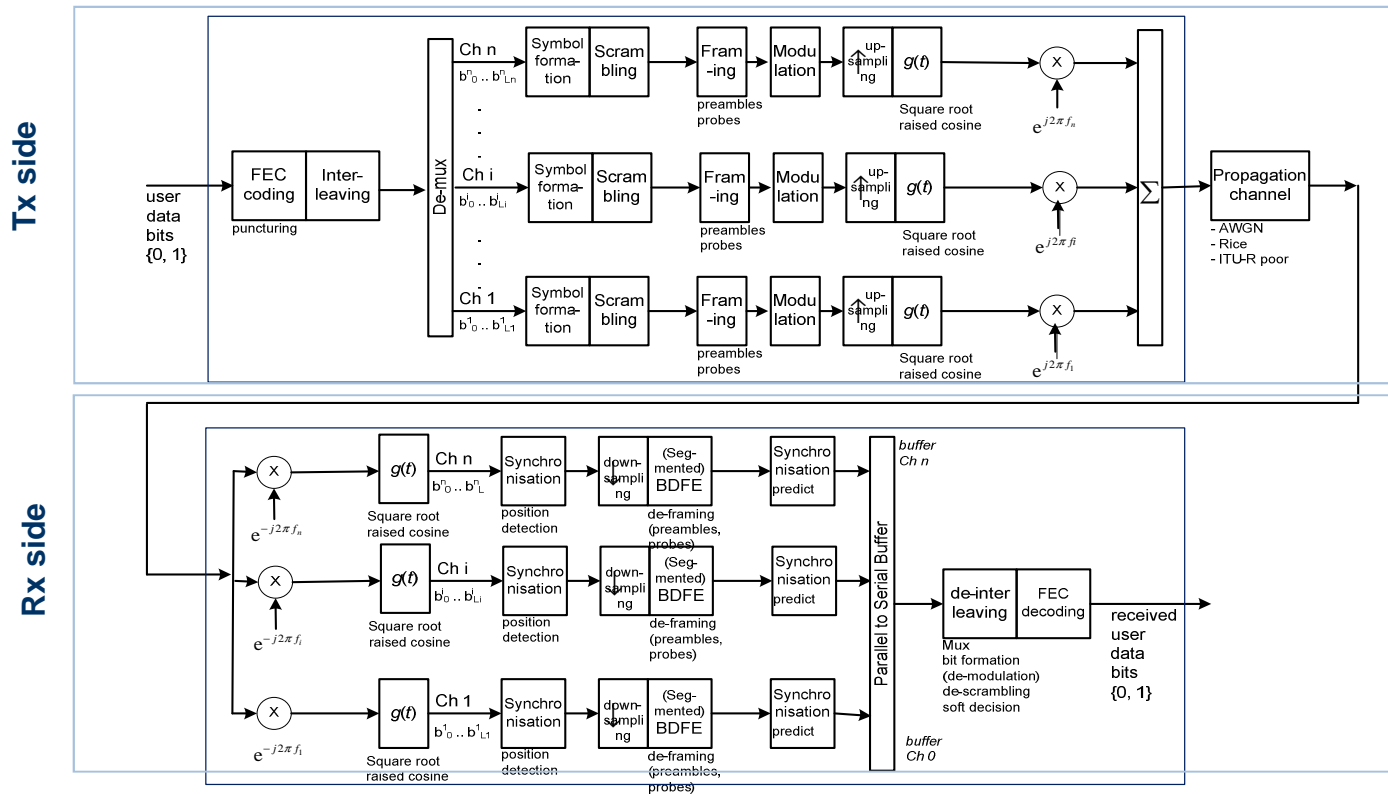
Overview of on-air testing and goals

- ◆ Set up
- ◆ Propagation predictions

Observed results

Conclusions

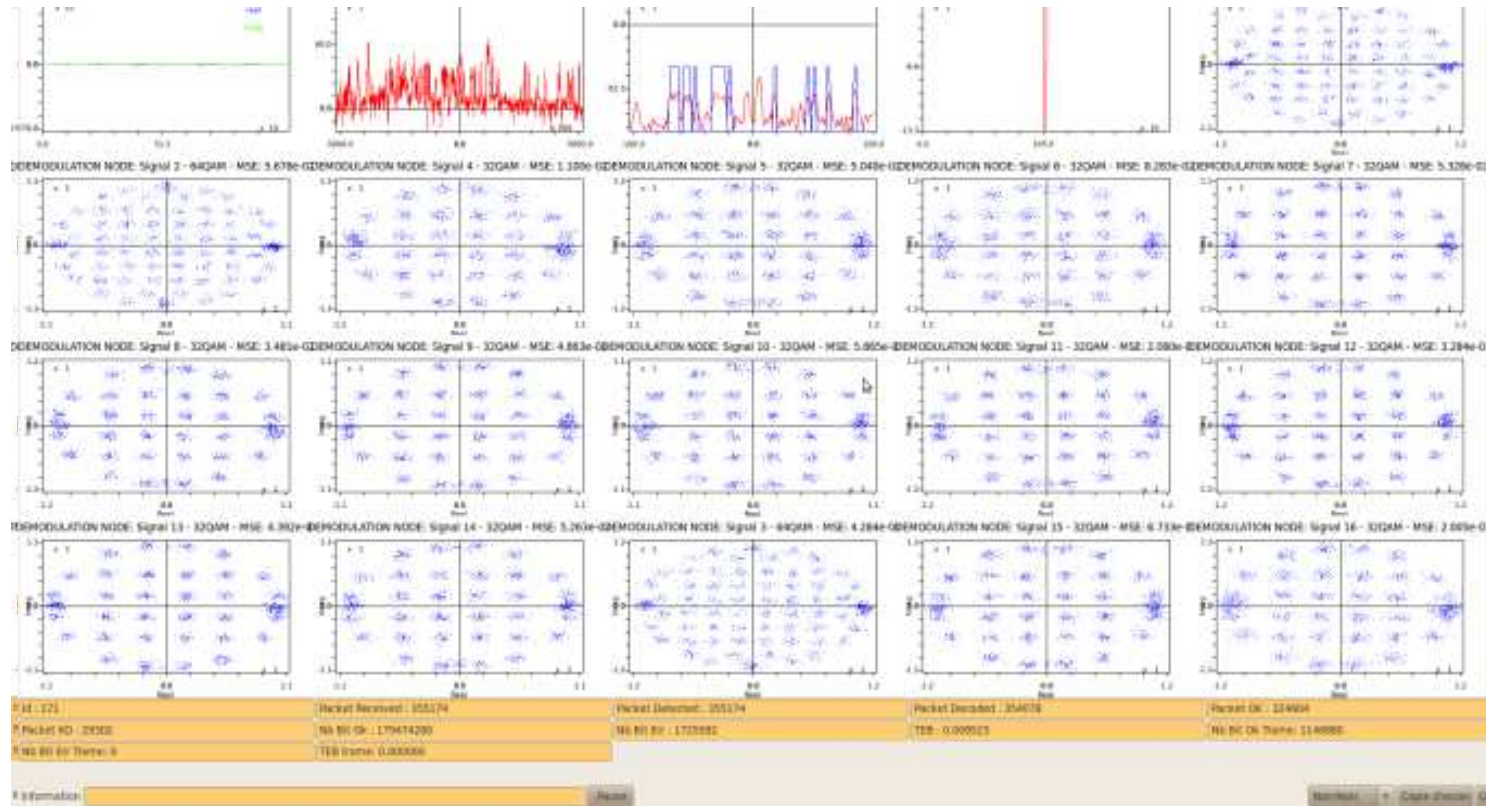
Modem structure (reminder, Cf. presentation HFIA Jan. 2013)



- ◆ Test bench capability upgraded to 16 channels

Waveform adaptation capability: example

- ◆ 16*16-QAM >> 10*32-QAM+6*16-QAM >> 13*32-QAM+3*64-QAM

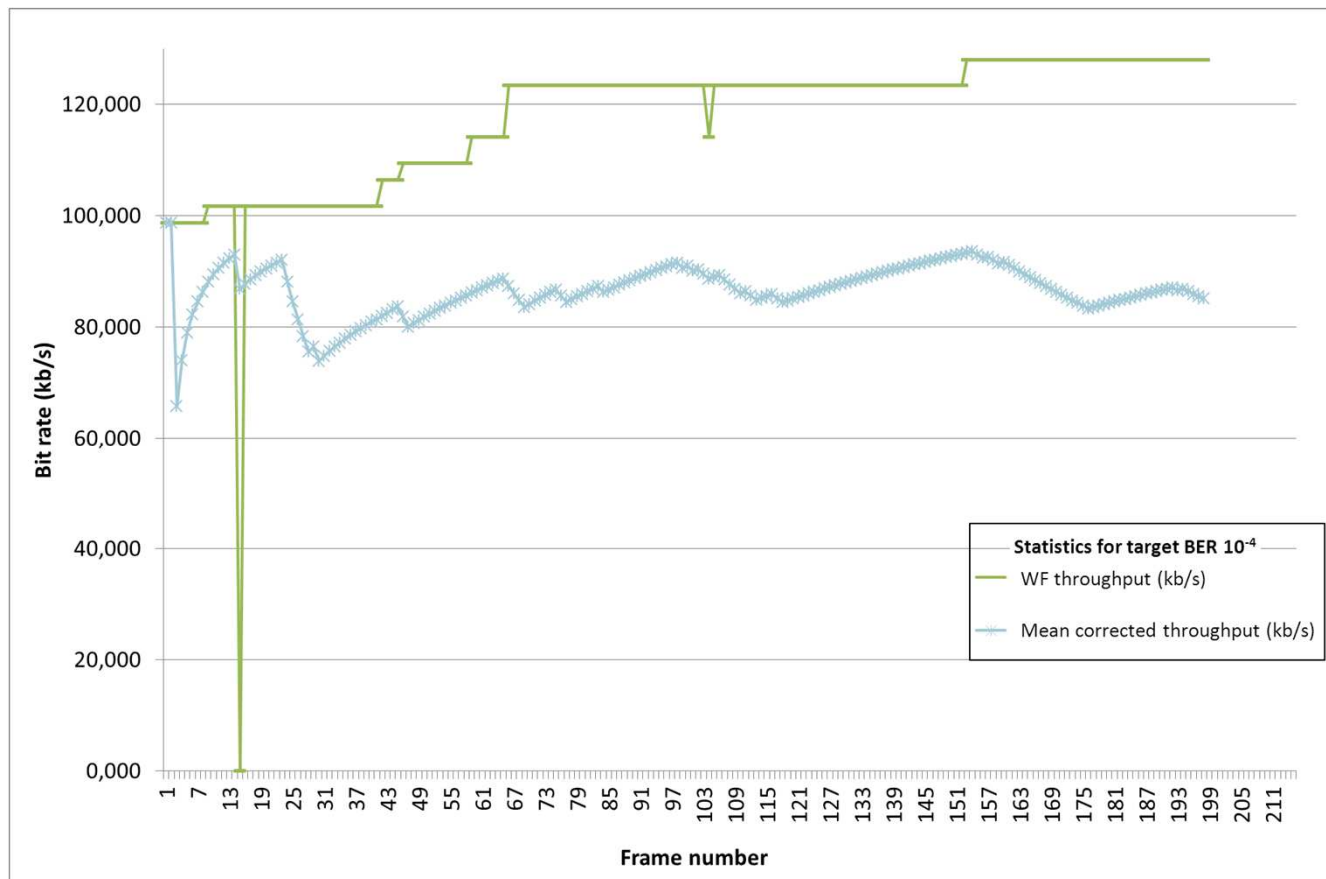


Considered link

- ◆ Tubize (BE) – Cormeilles (FR) ~ 250 km



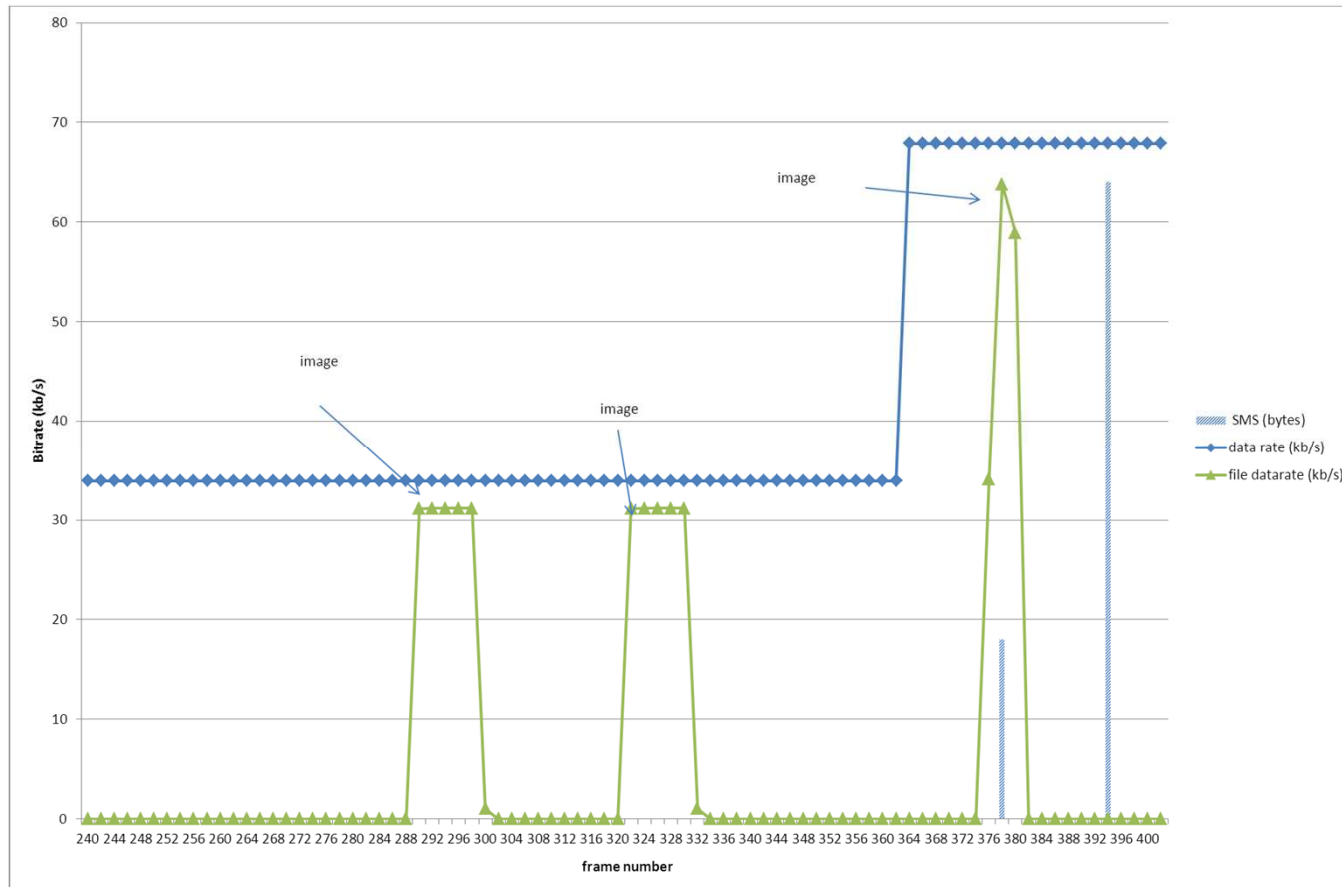
Observations – throughputs, random data transmission



Maintained bitrate 80-100kb/s over an excess of 1 hour

Data rate adaptation without impact on the transmitted information

Observations – real data transmission



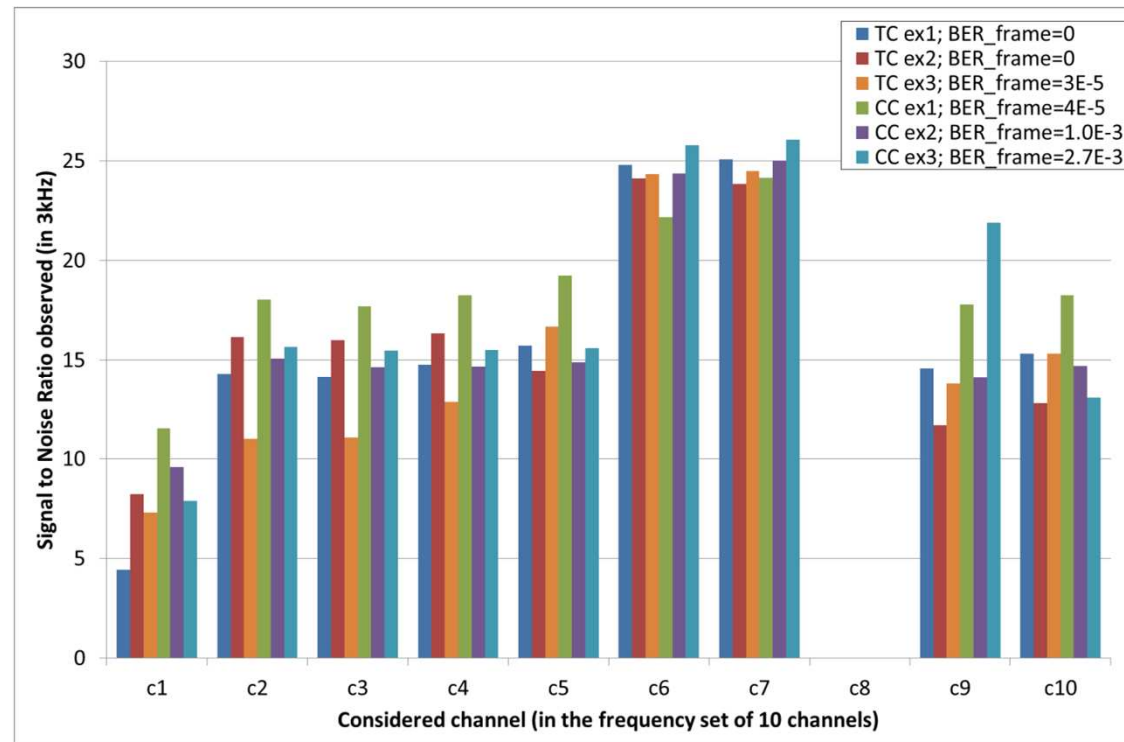
Aug. 15th, 2013 / TH/TCS/RCP/DT/ci,13/0033/PRE

Images and short messages transmitted over the air

Comparing achieved performance with different FEC

◆ TC vs CC – 9 used channels, 16-QAM modulation

- SNR measured varying between 5 and 25dB (in 3kHz channels)
- TC TEB=0 ~ CC TEB=10⁻³
- TC TEB=0 in worse conditions than CC TEB = 10⁻⁵



Examples of real channel performance confirm the expected gain of TC

Observations – ground waves

- ◆ No figure ... but something better:



Further developments made on HF XL waveform, with continuation of work on STANAG 4539 new annex

- ◆ In particular considering new FEC schemes (turbo code)

On air testing done with adaptation of the waveform over the air

- ◆ Peaks at 128 kb/s
- ◆ Average throughput 80-100 kb/s maintained over more than 1 hour

Application side : video transmission live ...



Thanks for your attention

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