

Opportunities in 470-694 MHz in Europe

NOKIA

Cooperation and coexistence in 470-694 MHz is possible

Earlier Nokia engagements in cooperative UHF use in Germany and Finland

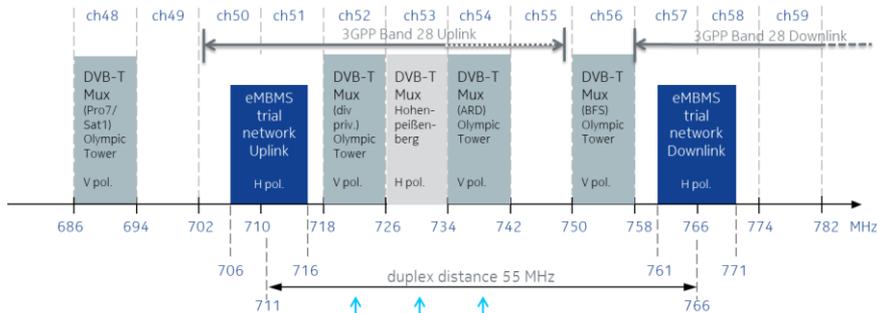
eMBMS Rel 12 field trials Munich

Partners e.g. IRT, BR, Rohde & Schwarz, Fraunhofer IIS, ...

Demonstrating capabilities and limitations of Rel 12 eMBMS for broadcast in terms of ISD, capacity (max 60% of DL) etc.

Also demonstrating mobile network operation options in then still broadcast spectrum, coexisting with broadcast

Building on Bd 28 commercial equipment while the 700 MHz band was still in active broadcast use



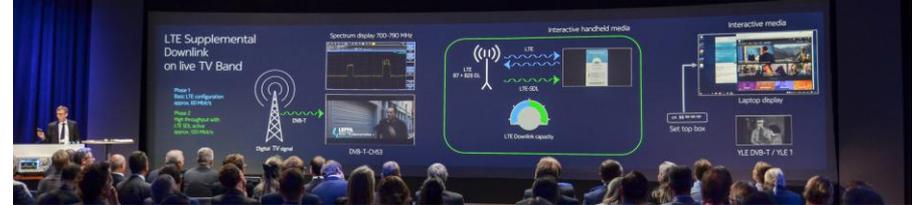
<https://gsacom.com/paper/lte-for-wide-area-broadcast-nokia-white-paper/>

700 MHz SDL field trials Helsinki

Partners e.g. Elisa, YLE, Qualcomm, Nokia ...

Demonstrating the possibility to enhance mobile network performance with SDL in then still broadcast spectrum

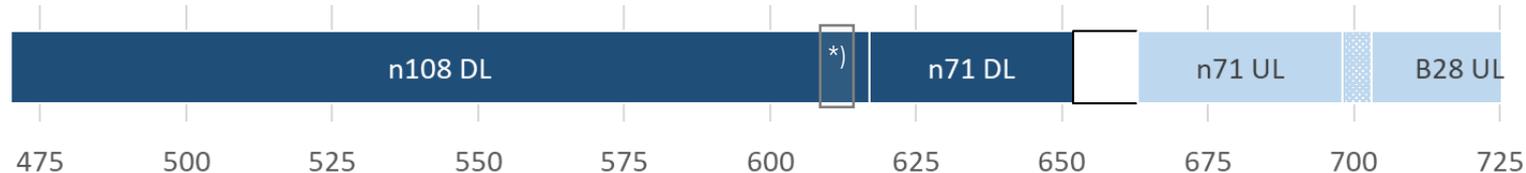
Building on Bd 28 commercial equipment (CA Bd 7 + Bd 28) while the 700 MHz band was still in active broadcast use



<https://yle.fi/aihe/artikkeli/2016/09/02/yle-qualcomm-and-nokia-announce-worlds-first-demonstration-lte-supplemental>

Co-existence, convergence and cooperation in 470-694 MHz

- Common 3GPP ecosystems for 5G broadcast, PPDR and mobile around 3GPP bands n71 and n108
- Ample DL bandwidth in hard-to-reach areas, rural and along transportation paths via substantial RF bandwidths sub 1 GHz, flexibly combining linear 5G-broadcast and nonlinear mobile, co-existing with DTT as per national needs, even before 2030
- Opportunity of shared use of spectrum and infrastructure between broadcast, PPDR and mobile, considering future FDD use in 600 MHz range
- Innovative spectrum access models at low cost, e.g. in reverse auctions for the lowest subsidies to cover a certain area
- Opportunity for Europe to innovate in technology, regulation and business models, scalable to global deployments



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