

DAB

SFN - Single-frequency network

SFN errors

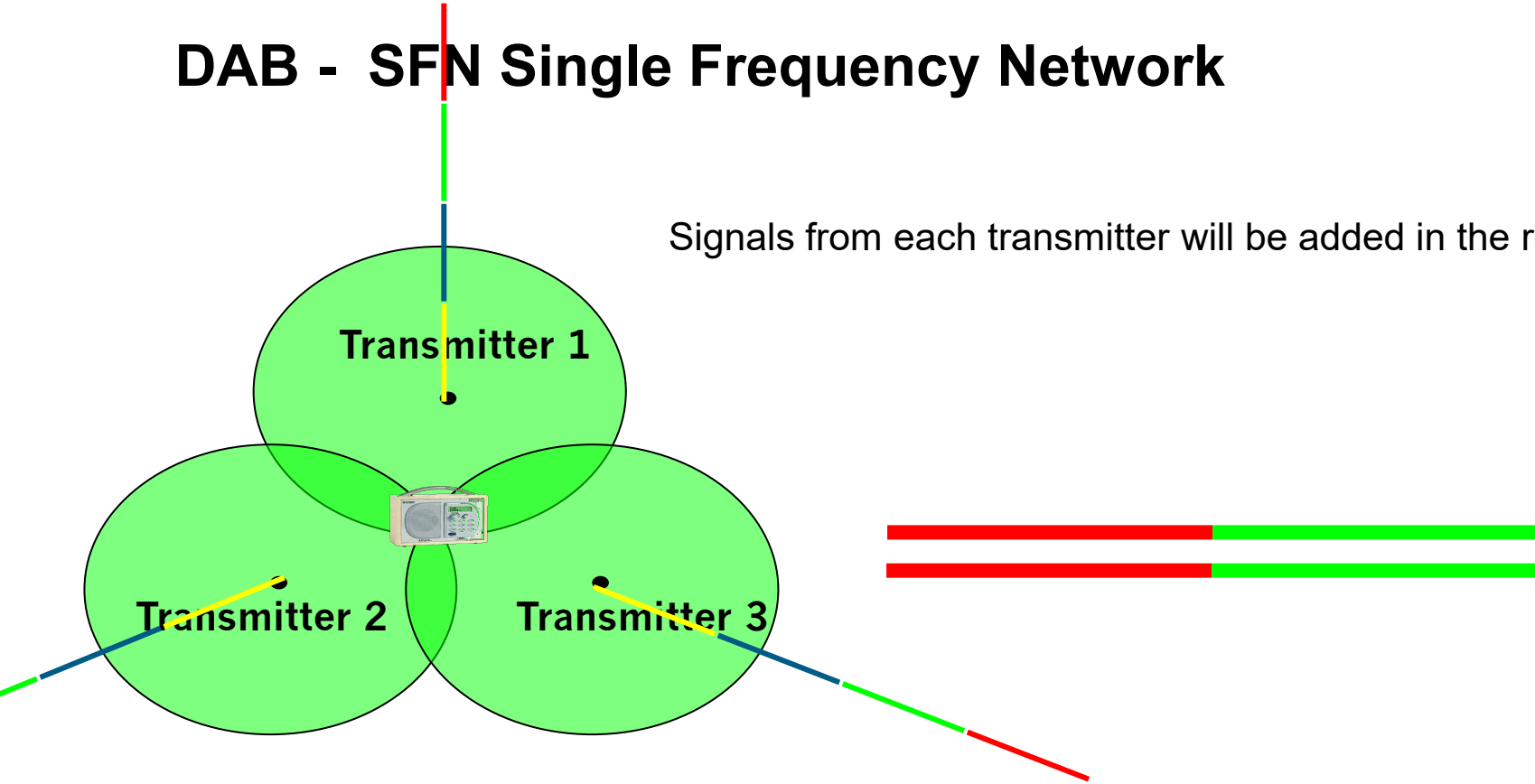
Christian Strøm Broadcast System Architect

Telenor operates 2 national DAB networks in Norway

- Comercial network 250 Tx, 93,5% population coverage
- Puplic broadcaster 1070 Tx 99,7% population coverage

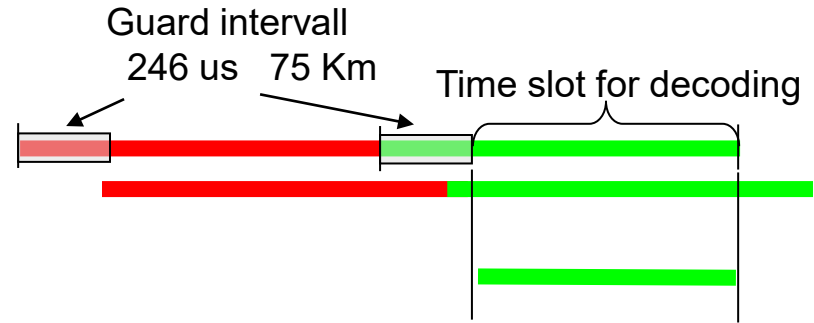
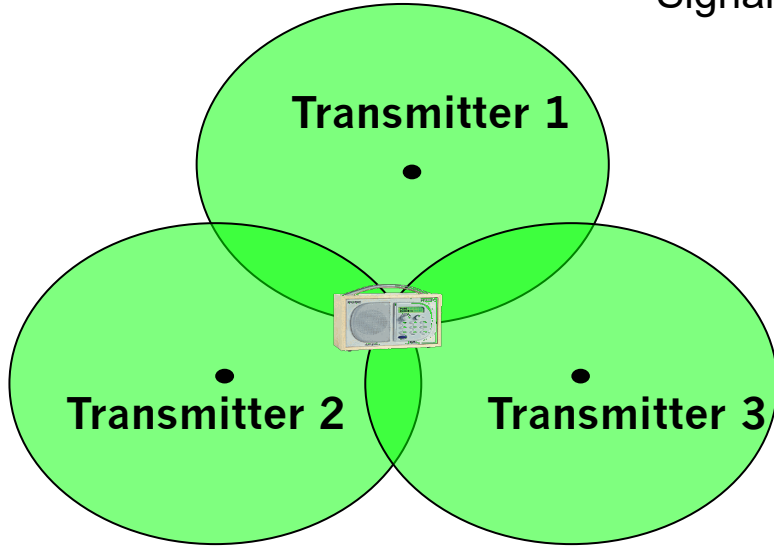
DAB - SFN Single Frequency Network

Signals from each transmitter will be added in the receiver.



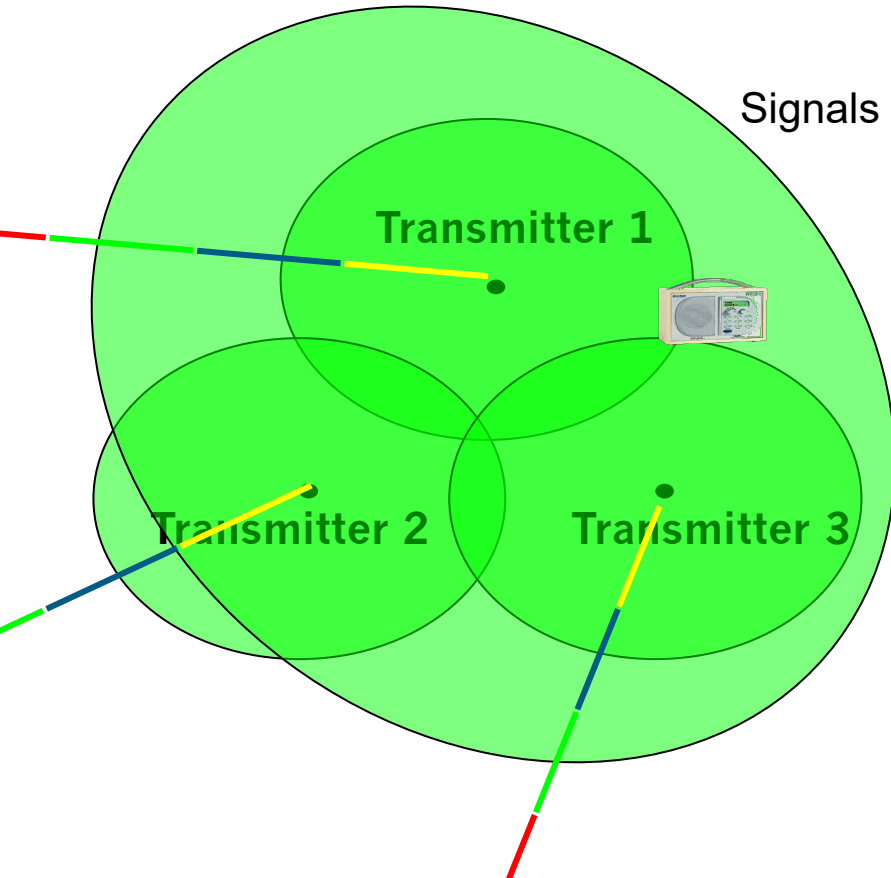
DAB - SFN Single Frequency Network

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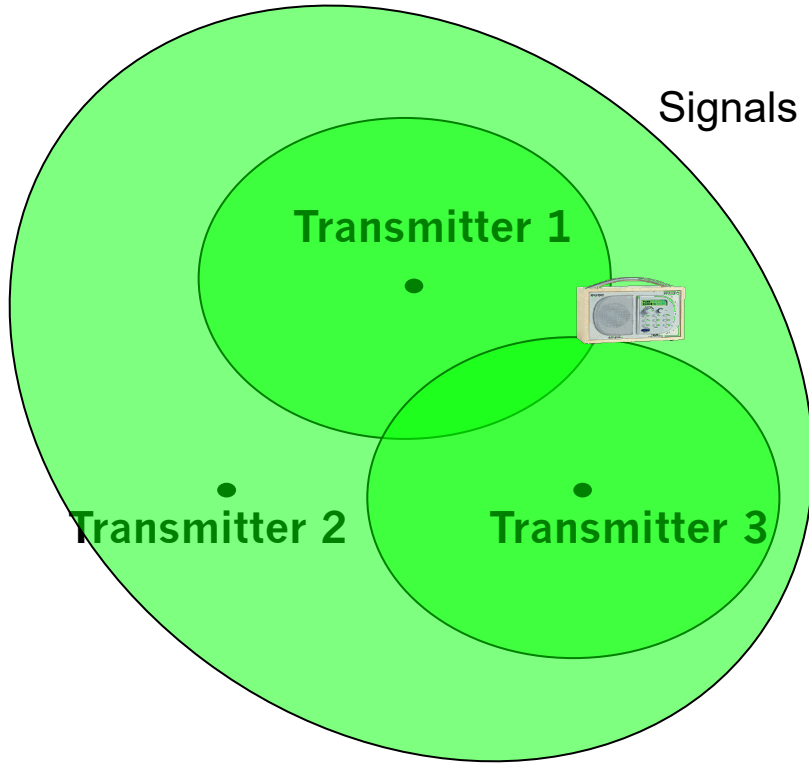


DAB - SFN Single Frequency Network

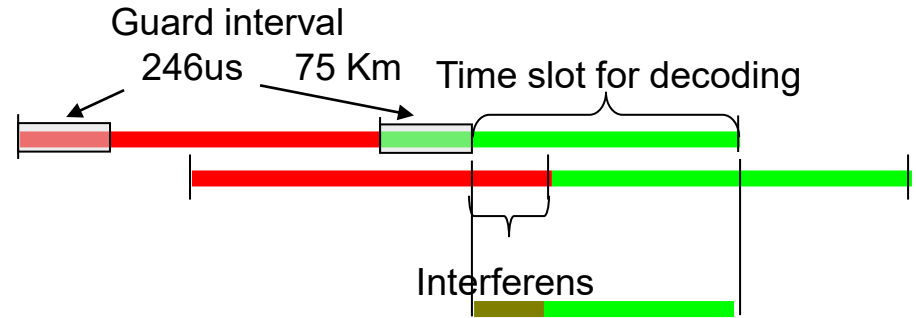
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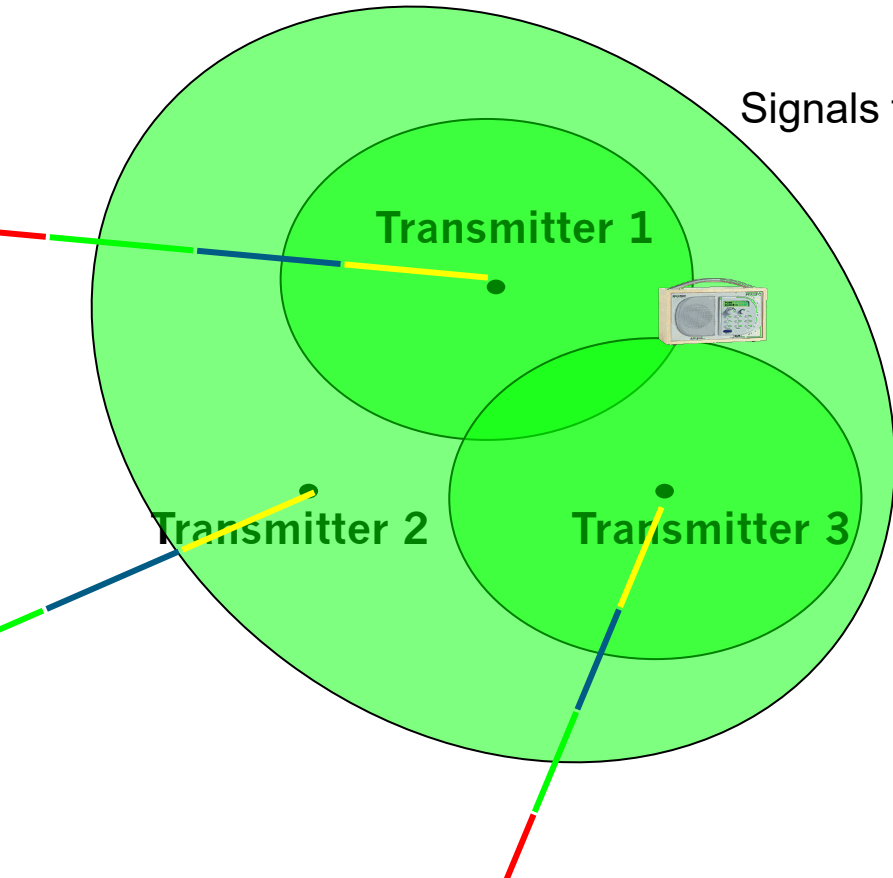
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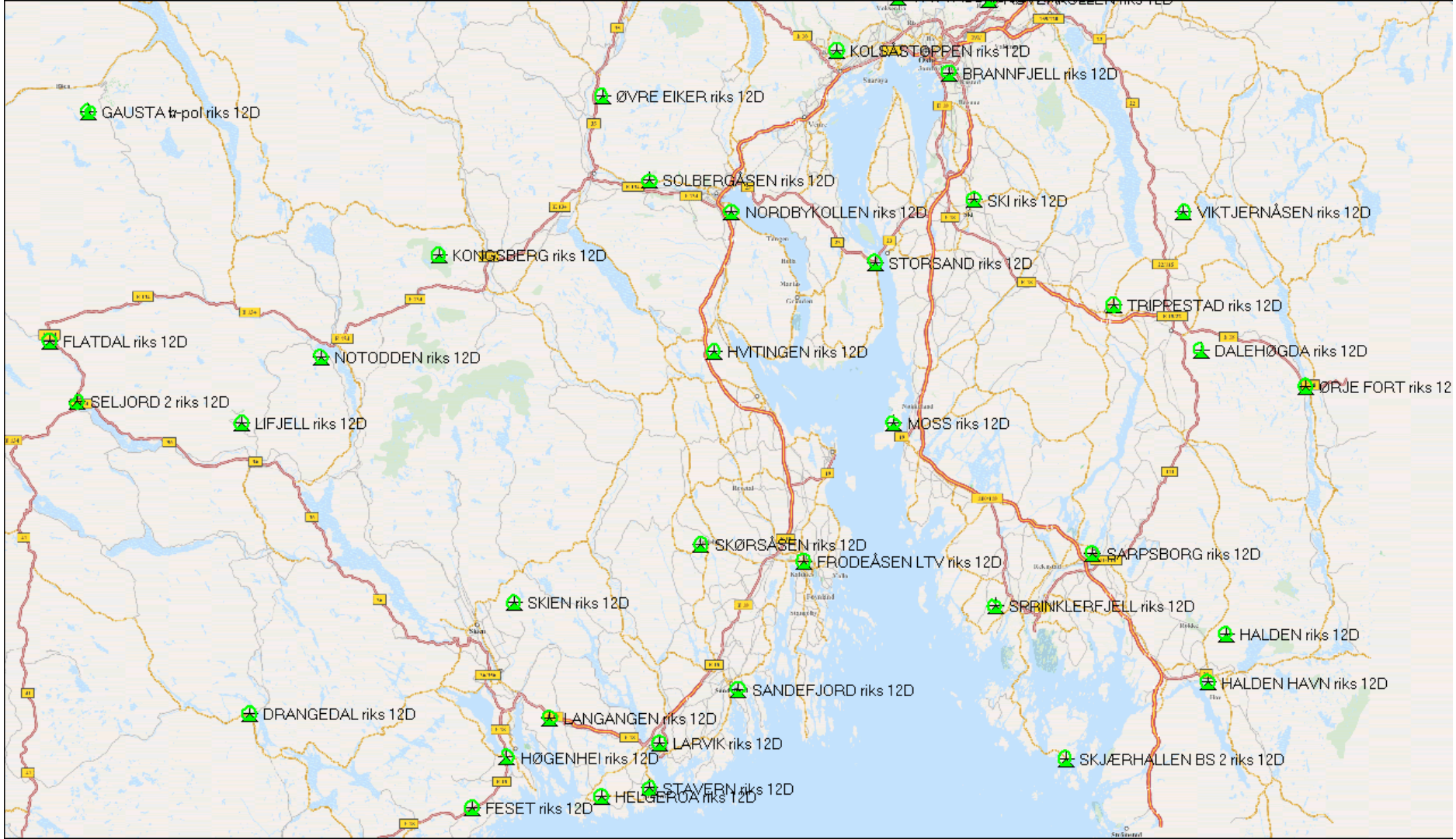


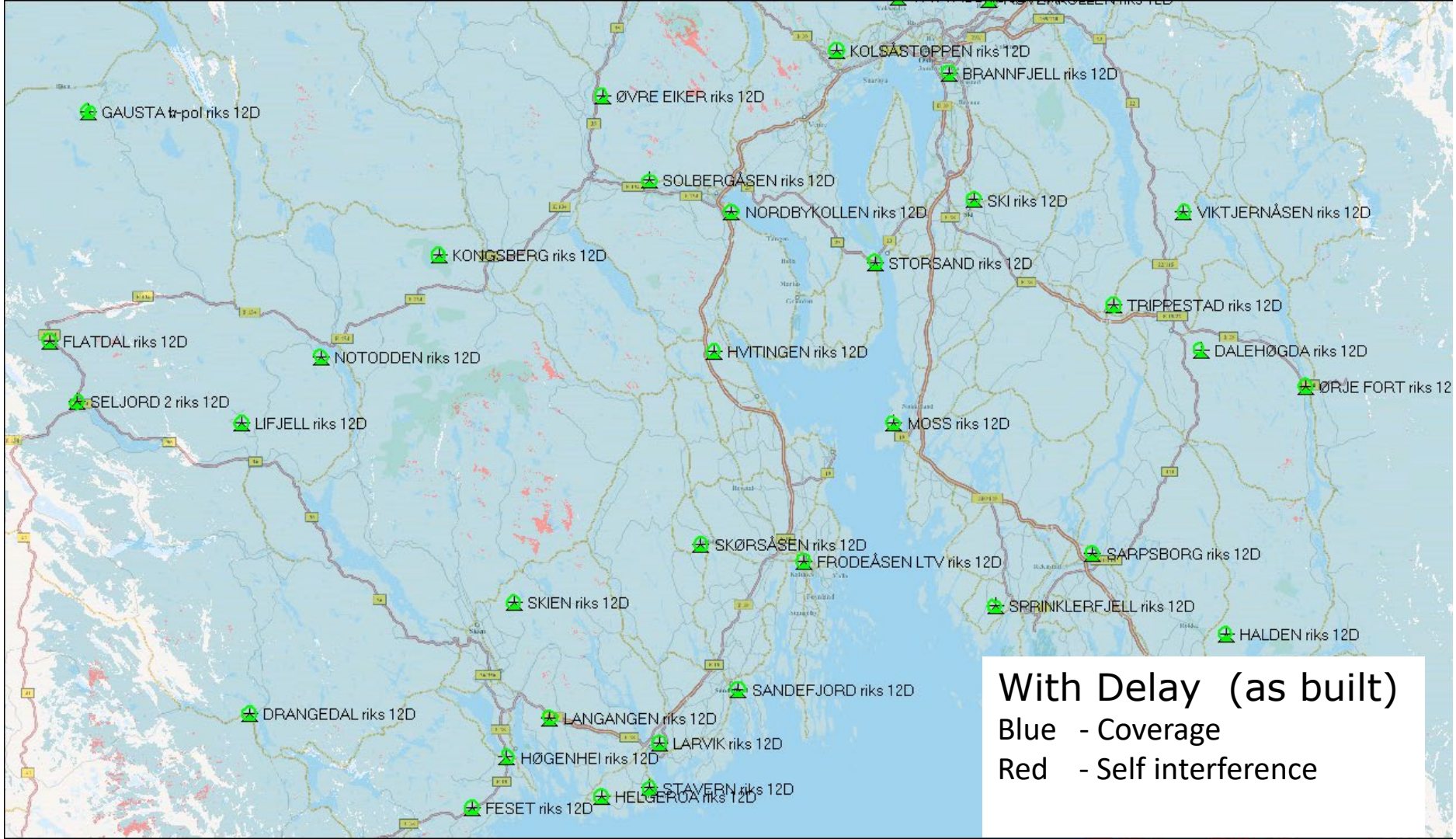
Signals from each transmitter will be added in the receiver.

This can be avoided/reduced by delaying some of the transmitters

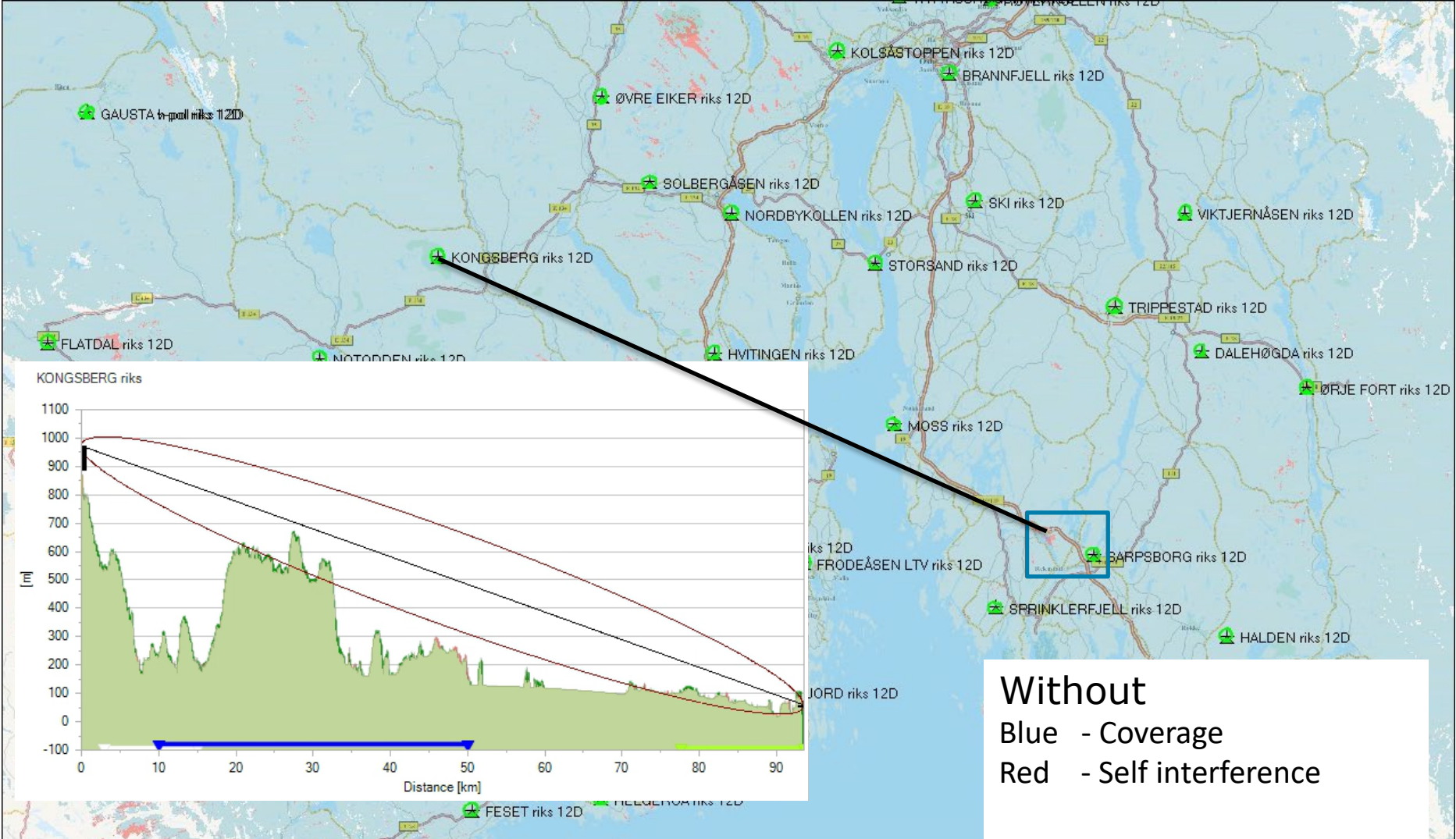
Southeast part of Norway







With Delay (as built)
Blue - Coverage
Red - Self interference



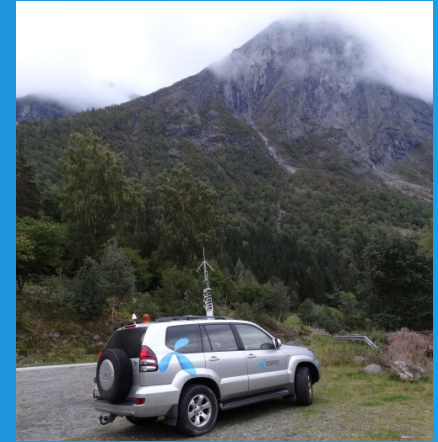
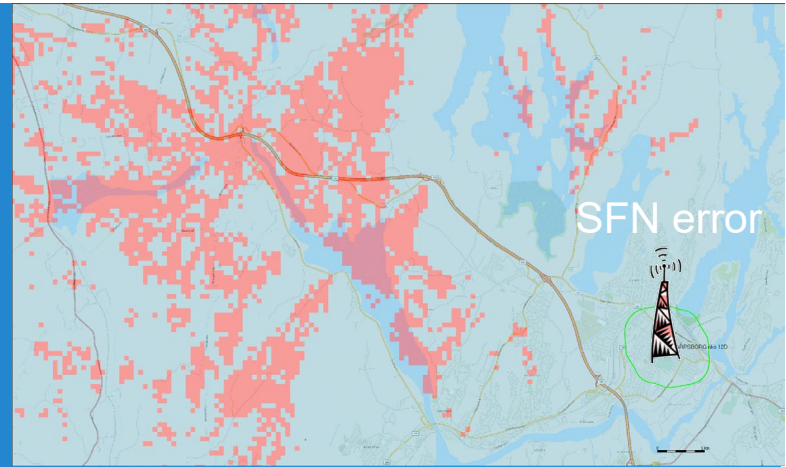
SFN error

If one transmitter has timing issues

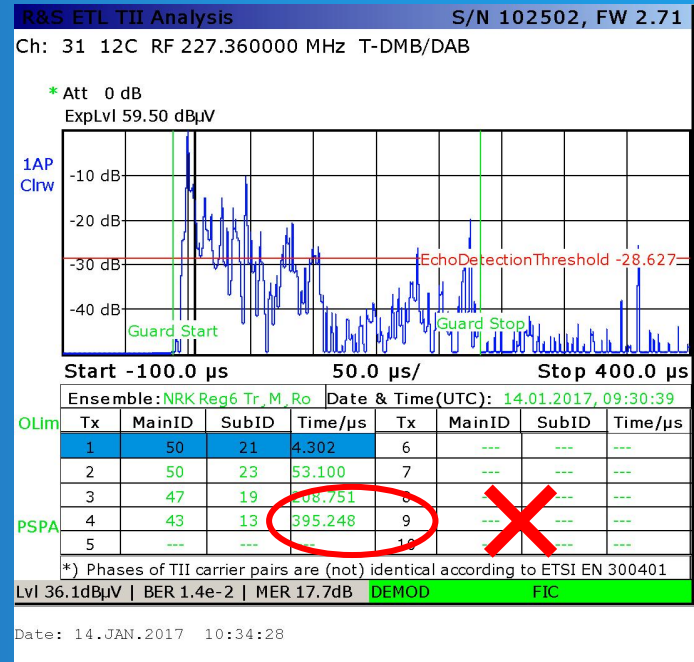
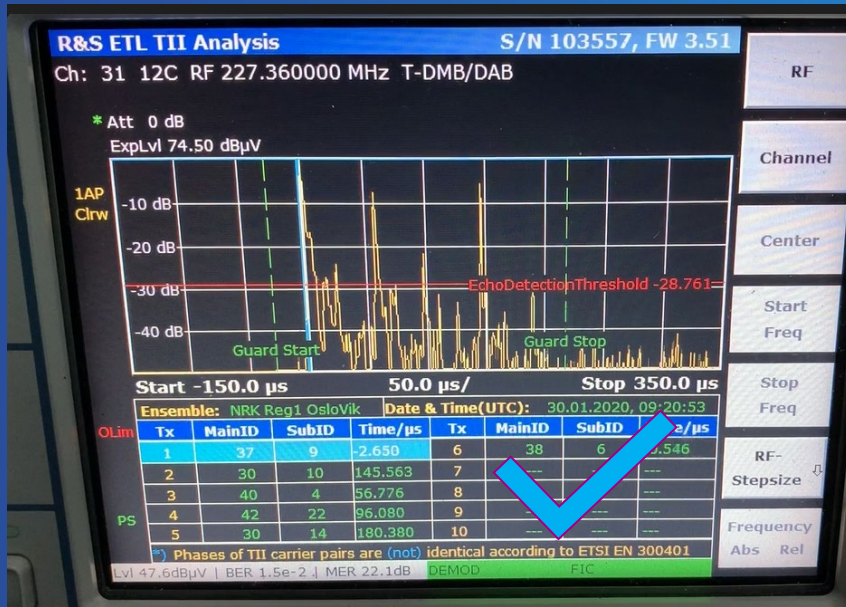
=> It will transmit signals at the wrong time

=> The output will cause self-interference in some areas.

- Listeners will complain that there is no signal.
- Close to the transmitter reception will be OK
- You need to go out in the field and look at the impulse response



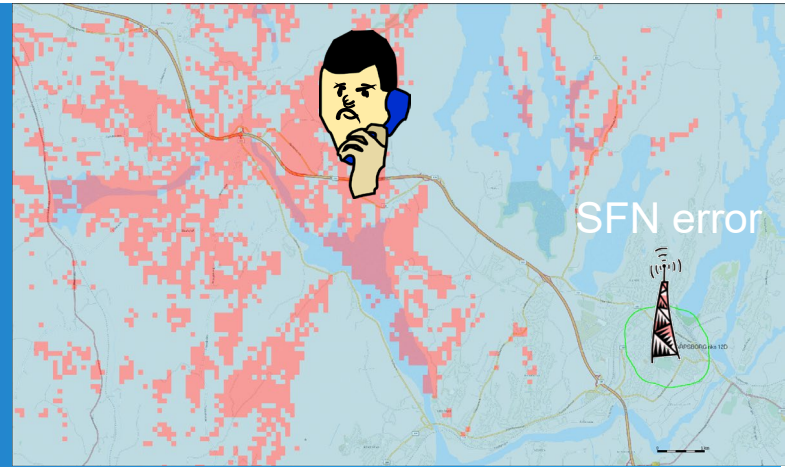
Results using R&S ETL measuring equipment



Transmitter ID TII 43 13 - Sarpsborg

SFN errors

- Difficult to detect
- Often listeners will complain
- If you suspect one transmitter has a SFN error
 - You can turn it off for a short time to see if the problem disappears
While the person who complains are on the telephone with you.
 - Sometime rebooting the transmitter, fixes the problem



Thank you for listening

Christian Strøm
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