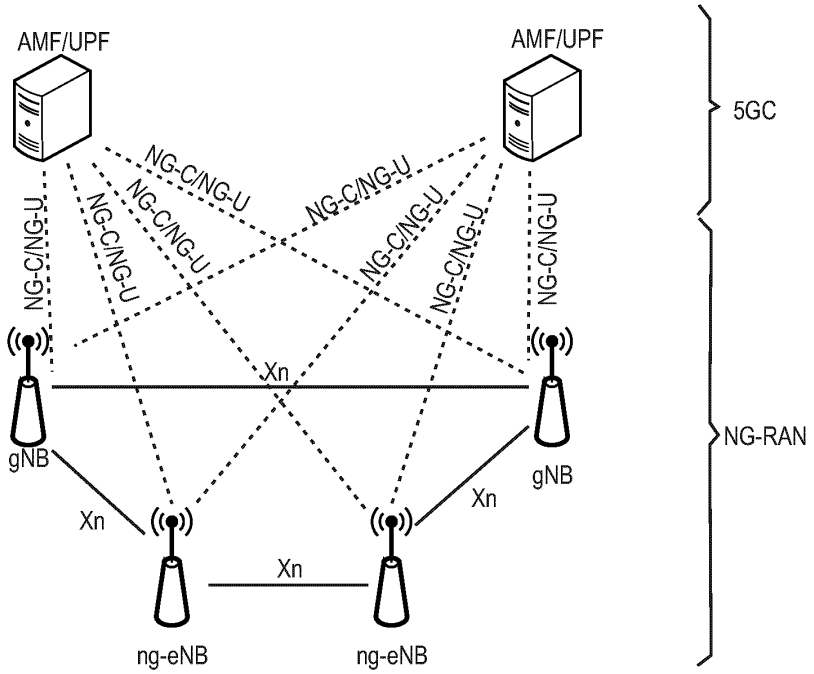

AMF/UPF
AMF/UPF
5GC
NG-C/NG-U
NG-C/NG-U
NG-C/NG-U
NG-C/NG-U
NG-C/NG-U
NG-C/NG-U
NG-C/NG-U
NG-C/NG-U
Xn
gNB
gNB
Xn
Xn
Xn
ng-eNB
ng-eNB
NG-RAN

Fig. 1

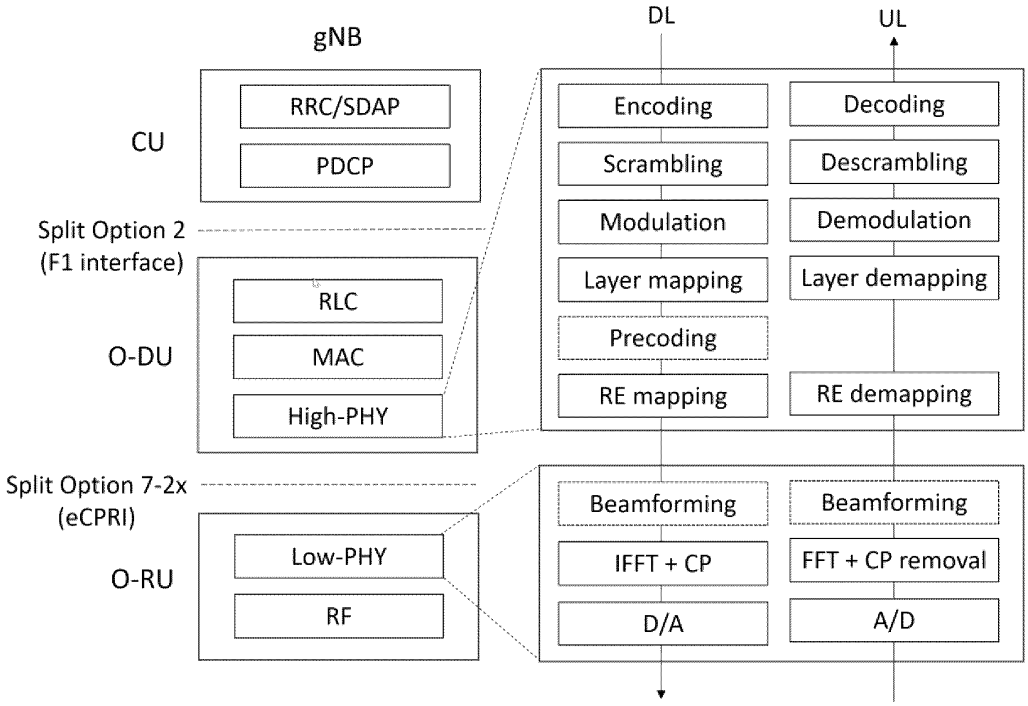

gNB
DL
UL
CU
RRC/SDAP
PDCP
Split Option 2
(F1 interface)
O-DU
RLC
MAC
High-PHY
Split Option 7-2x
(eCPRI)
O-RU
Low-PHY
RF
Encoding
Scrambling
Modulation
Layer mapping
Precoding
RE mapping
Decoding
Descrambling
Demodulation
Layer demapping
RE demapping
Beamforming
IFFT + CP
D/A
Beamforming
FFT + CP removal
A/D

Fig. 2

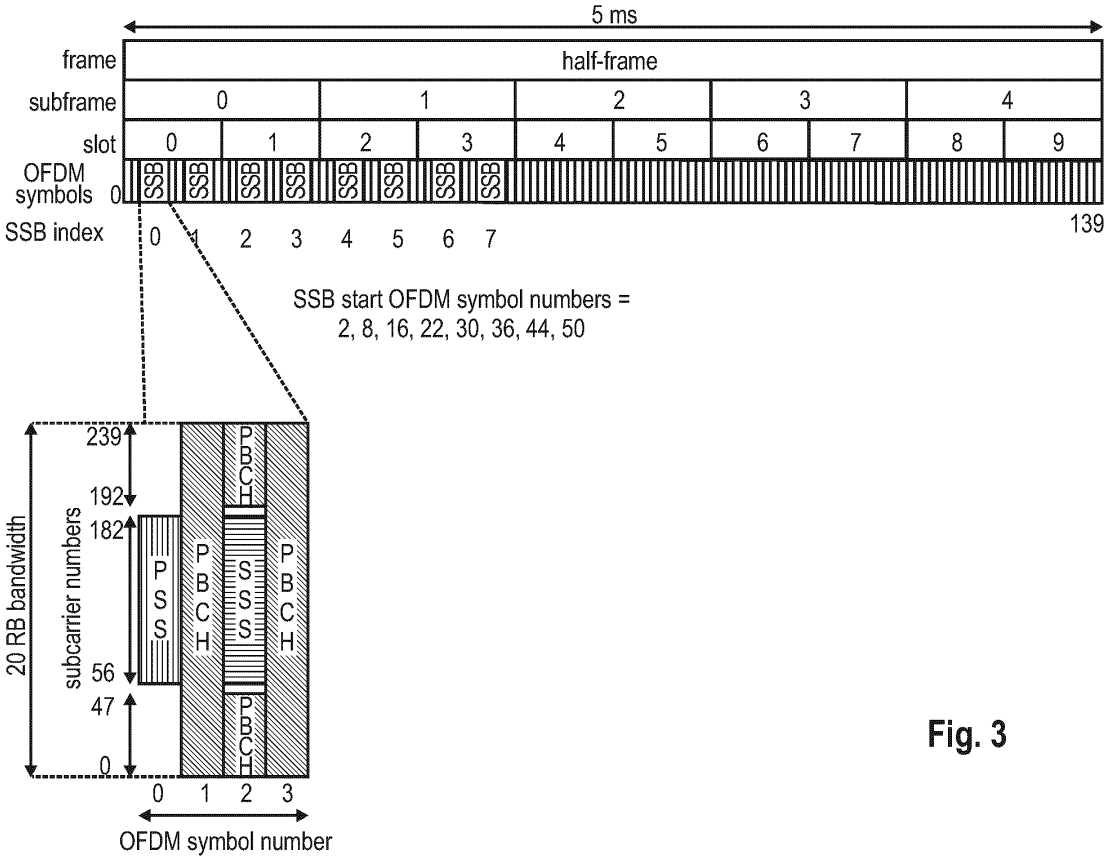

5 ms
frame
half-frame
subframe
0
1
2
3
4
slot
0
1
2
3
4
5
6
7
8
9
OFDM symbols
0
SSB
SSB index
0
1
2
3
4
5
6
7
139
SSB start OFDM symbol numbers =
2, 8, 16, 22, 30, 36, 44, 50
20 RB bandwidth
subcarrier numbers
239
192
182
56
47
0
PBCH
PSS
SSS
PBCH
PBCH
0
1
2
3
OFDM symbol number

Fig. 3

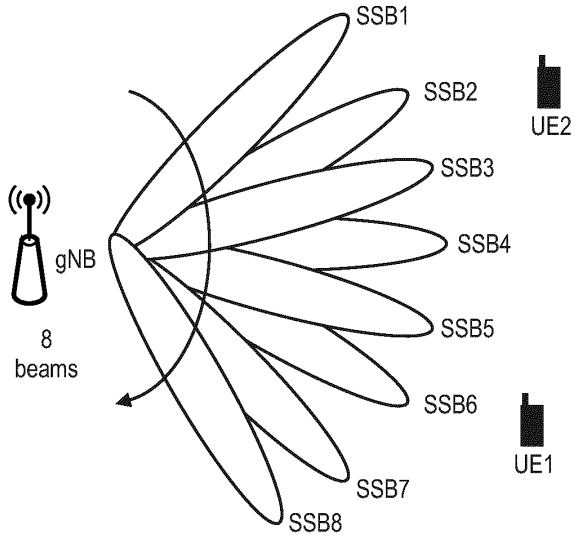

SSB1
SSB2
UE2
SSB3
SSB4
gNB
SSB5
8
beams
SSB6
UE1
SSB7
SSB8

Fig. 4

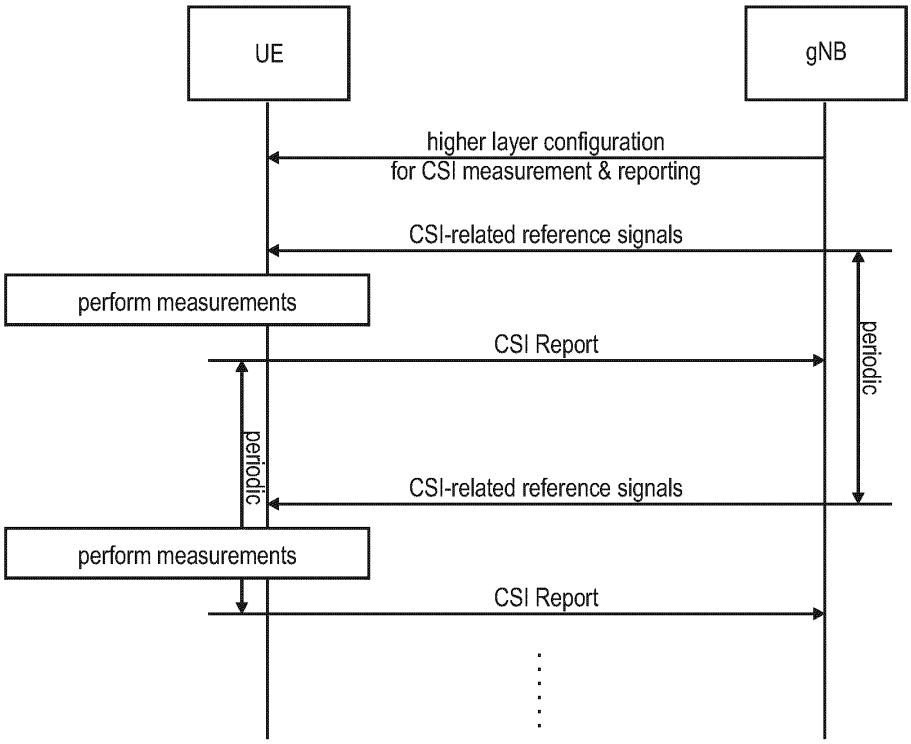

UE
gNB
higher layer configuration
for CSI measurement & reporting
CSI-related reference signals
perform measurements
CSI Report
periodic
periodic
CSI-related reference signals
perform measurements
CSI Report

Fig. 5

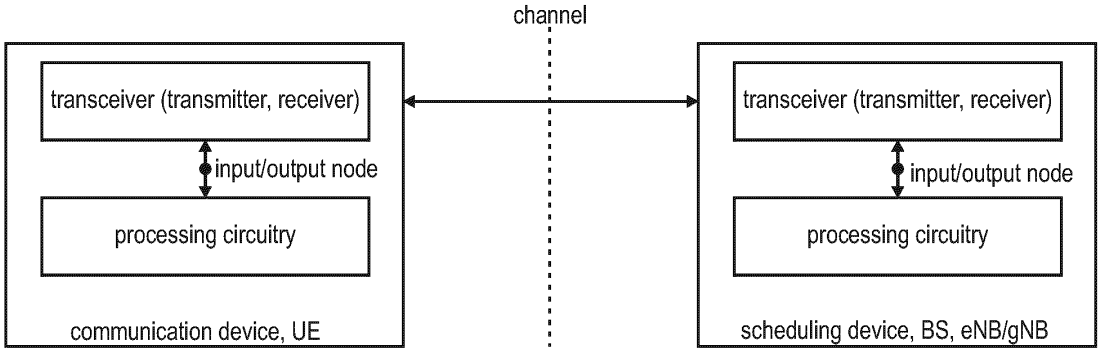

channel
transceiver (transmitter, receiver)
input/output node
processing circuitry
communication device, UE
transceiver (transmitter, receiver)
input/output node
processing circuitry
scheduling device, BS, eNB/gNB

Fig. 6

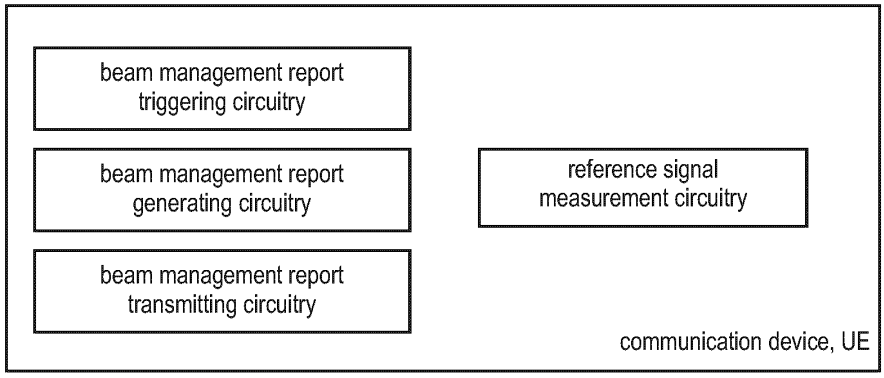

beam management report triggering circuitry
beam management report generating circuitry
beam management report transmitting circuitry
reference signal measurement circuitry
communication device, UE

Fig. 7

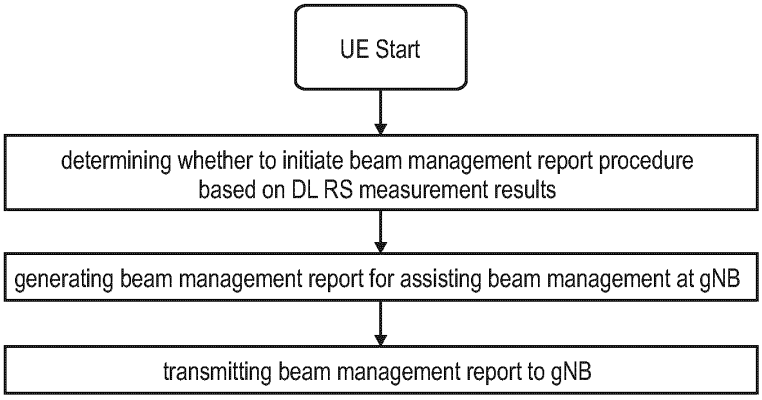

UE Start
determining whether to initiate beam management report procedure based on DL RS measurement results
generating beam management report for assisting beam management at gNB
transmitting beam management report to gNB

Fig. 8

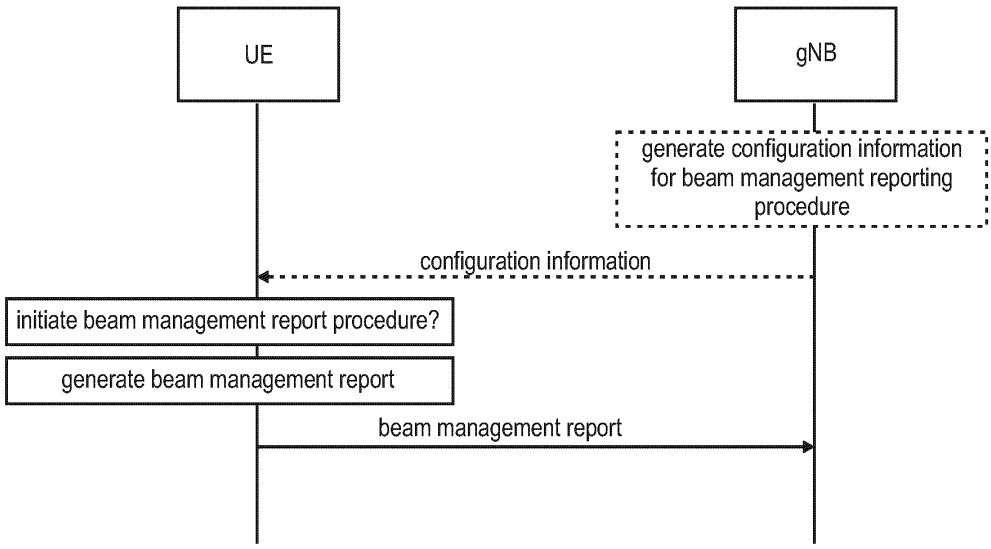


Fig. 9

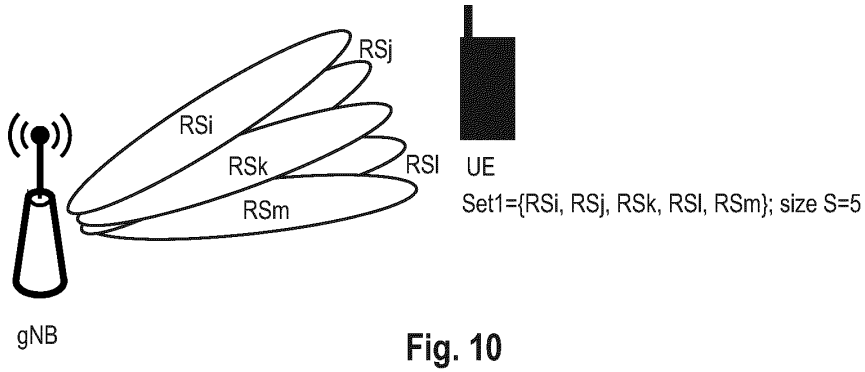


Fig. 10

detailed beam management report for Y=4 RSs

Reference signals	Quality Metric
RSi	RSRP_RSi
RSj	RSRP_RSj
RSk	RSRP_RSk
RSl	RSRP_RSl

Fig. 11

intermediate beam management report for X=2 RSs

Reference signals
RSk
RSl

Fig. 12

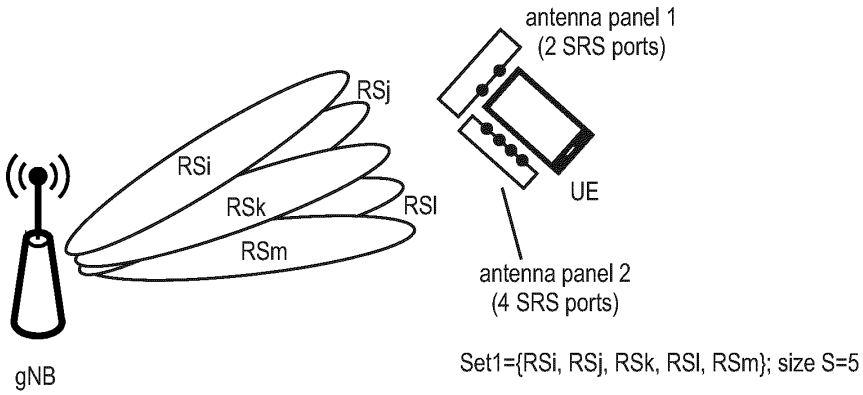


Fig. 13

detailed beam management report for Y=4 RSs

Reference signals	Quality Metric	Antenna panel
RSi	RSRP_RSi_AP2	4 SRS ports
RSj	RSRP_RSj_AP1	2 SRS ports
RSk	RSRP_RSk_AP2	4 SRS ports
RSl	RSRP_RSl_AP1	2 SRS ports

Fig. 14

intermediate beam management report for X=2 RSs

Reference signals	Antenna panel
RSk	4 SRS ports
RSl	2 SRS ports

Fig. 15

intermediate beam management report for X=2 RSs

Reference signals
RSk
RSl

+

Antenna panel
4 SRS ports

Fig. 16