

【CLAIMS】

【Claim 1】

A method of performing, by a user equipment (UE), a beam failure recovery in a wireless communication system, the method comprising:

detecting a beam failure;

identifying a new beam for the beam failure recovery; and

transmitting, to a base station (BS), a beam failure recovery request using a Physical Random Access Channel (PRACH) resource,

wherein the PRACH resource includes a first PRACH resource and a second PRACH resource, being associated with a Synchronization Signal block (SSB),

wherein the first PRACH resource and the second PRACH resource are associated with a SS block (SSB),

wherein, based on the SSB being identified as the new beam, the beam failure recovery request is transmitted using the first PRACH resource,

wherein, based on a channel state information (CSI)-reference signal (RS) resource being identified as the new beam, the beam failure recovery request is transmitted using the second PRACH resource.

【Claim 2】

The method of claim 1, wherein the CSI-RS resource is spatially quasi-co located (QCL) with the SSB.

【Claim 3】

The method of claim 1, wherein the new beam is at least one RS satisfying a predefined condition.

【Claim 4】

The method of claim 3, wherein when both the SSB and the CSI-RS resource satisfy the predefined condition, the CSI-RS resource is identified as the new beam.

【Claim 5】

A method of performing, by a base station (BS), a beam failure recovery in a wireless communication system, the method comprising:

transmitting, to a user equipment (UE), information related to a new beam identification for the beam failure recovery; and

receiving a beam failure recovery request from the UE using a Physical Random Access Channel (PRACH) resource,

wherein the PRACH resource includes a first PRACH resource and a second PRACH resource,

wherein the first PRACH resource and the second PRACH resource are associated with a Synchronization Signal block (SSB),

wherein, based on the new beam being the SSB, the beam failure recovery request uses the first PRACH resource,

wherein, based on the new beam being a channel state information (CSI)-reference

signal (RS) resource, the beam failure recovery request uses the second PRACH resource.

【Claim 6】

The method of claim 5, wherein the CSI-RS resource is spatially quasi-co located (QCL) with the SSB.

【Claim 7】

The method of claim 5, wherein the new beam is at least one RS satisfying a predefined condition.

【Claim 8】

The method of claim 7, wherein when both the SSB and the CSI-RS resource satisfy the predefined condition, the CSI-RS resource is identified by the UE as the new beam.

【Claim 9】

A user equipment (UE) performing a beam failure recovery in a wireless communication system, the UE comprising:

at least one transceiver configured to transmit and receive a radio signal; and

at least one processor functionally connected to the at least one transceiver,

wherein the at least one processor is configured to:

detect a beam failure;

identify a new beam for the beam failure recovery; and

transmit a beam failure recovery request to a base station using a Physical Random Access Channel (PRACH) resource,

wherein the PRACH resource includes a first PRACH resource and a second PRACH resource,

wherein the first PRACH resource and the second PRACH resource are associated with a Synchronization Signal block (SSB),

wherein, based on the SSB being identified as the new beam, the beam failure recovery request is transmitted,

wherein, based on a reference signal (RS) resource being identified as the new beam, the beam failure recovery request is transmitted using the second PRACH resource.

【Claim 10】

The UE of claim 9, wherein the CSI-RS resource is spatially quasi-co located (QCL) with the SSB.

【Claim 11】

The UE of claim 9, wherein the new beam is at least one RS satisfying a predefined condition.

【Claim 12】

The UE of claim 11, wherein when both the SSB and the CSI-RS resource satisfy the predefined condition, the CSI-RS resource is identified as the new beam.

【Claim 13】

A user equipment (UE) performing a beam failure recovery in a wireless communication system, the UE comprising:

at least one transceiver configured to transmit and receive a radio signal; and

at least one processor functionally connected to the at least one transceiver,

wherein the at least one processor is configured to:

detect a beam failure related to a plurality of Physical Downlink Control Channels (PDCCHs);

transmit, to a base station (BS), a beam failure recovery request using a Physical Random Access Channel (PRACH) or a Physical Uplink Control Channel (PUCCH) based on the beam failure,

wherein, based on a part of the plurality of PDCCH beams being failing, the beam failure recovery request is transmitted using a first PUCCH associated to a PDCCH satisfying a predefined condition,

wherein, based on the plurality of PDCCH beams being failing, the beam failure recovery request is transmitted using the PRACH or a second PUCCH.

【Claim 14】

The UE of claim 13, wherein the first PUCCH is based on a PUCCH format 2, a PUCCH format 3 or a PUCCH format 4,

wherein the second PUCCH is based on a PUCCH format 0 or a PUCCH format 1.

【Claim 15】

The UE of claim 13, wherein, when the plurality of PDCCH beams fail, the PRACH is used in preference to the second PUCCH.