
ANNEX A

Claims

1. A method for multiplexing of uplink data-non-associated control signalling, comprising:
 - using a cyclic shift of a pre-determined sequence to generate an individual data-non-associated control signalling symbol sequence;
 - spreading the individual data-non-associated control signalling symbol sequence;
 - mapping the spread individual data-non-associated control signalling symbol sequence to an orthogonal resource;
 - adding a cyclic prefix to the spread and mapped individual data-non-associated control signalling symbol sequence to form a data-non-associated control signalling information; and
 - transmitting the data-non-associated control signalling information.
2. The method of any preceding claim-1, wherein the orthogonal resources are within a semi-statically assigned time frequency region for UEs that transmit only L1/L2 control information-resource elements assigned for the transmission of a physical uplink control channel (PUCCH).
3. The method of any preceding claim-1, where the data-non-associated control signalling comprises at least one of ACK information, NACK information, and CQI information, ~~and scheduling request information~~.
4. The method of any preceding claim-1, where spreading comprises using separate spreading operations for ACK/NACK and reference sequences.
5. The method of any preceding claim-1, where the pre-determined sequence comprises constant amplitude zero auto correlation sequences (CAZAC) or zero autocorrelation sequences (ZAC).

6. The method of any preceding claim, wherein the spreading uses Hadamard spreading.
7. An apparatus (10, 12, 14) for multiplexing of uplink data-non-associated control signaling, comprising:
 - a unit (10E) configured to use a cyclic shift of a pre-determined sequence to generate an individual data-non-associated control signaling symbol sequence;
 - a spreading unit (10F) configured to spread the individual data-non-associated control signaling symbol sequence;
 - a mapping unit (10H) configured to map the spread individual data-non-associated control signaling symbol sequence to an orthogonal resource;
 - a processor (10A, 12A, 14A) configured to add a cyclic prefix to the spread and mapped individual data-non-associated control signaling symbol sequence to form a data-non-associated control signaling information; and
 - a transmitter unit (10D, 12D) configured to transmit the data-non-associated control signaling information.
8. The apparatus of claim 7, wherein the orthogonal resources are within a semi-statically assigned time frequency region for UEs that transmit only L1/L2 control information ~~resource elements assigned for transmission of a physical uplink control channel (PUCCH).~~
9. The apparatus of any of claims 7 to 8, wherein the data-non-associated control signaling comprises at least one of ACK information, NACK information, and CQI information, ~~and scheduling request information.~~
10. The apparatus of any of claims 7 to 9, wherein spreading comprises using separate sequences for control data information and reference signal information.
11. The apparatus of any of claims 7 to 10, wherein the pre-determined sequence comprises constant amplitude zero auto correlation sequences (CAZAC) or zero autocorrelation sequences (ZAC).
12. The apparatus of any of claims 7 to 11, further comprising spreading using Hadamard spreading.

13. The apparatus of any of claims 7 to 12, wherein the apparatus is a user equipment (UE).
14. A computer readable medium encoded with a computer program (10C, 12C, 14C) executable by a processor (10A, 12A, 14A) to perform actions for multiplexing of uplink data-non-associated control signaling comprising:
 - using a cyclic shift of a pre-determined sequence to generate an individual data-non-associated control signaling symbol sequence;
 - spreading the individual data-non-associated control signaling symbol sequence;
 - mapping the spread individual data-non-associated control signaling symbol sequence to an orthogonal resource;
 - adding a cyclic prefix to the spread and mapped individual data-non-associated control signaling symbol sequence to form a data-non-associated control signaling information; and
 - transmitting the data-non-associated control signaling information.

ANNEX B

Claims

Insert a new claim 2 (with consequential re-numbering):

2. The method of claim 1, wherein the uplink data-non-associated control signalling is multiplexed into a 180 kHz PRB.

Amend current claim 6 (renumbered claim 7):

- ~~6-7.~~ The method of any preceding claim, wherein the spreading uses Hadamard spreading, performed with SF=4.

Insert a new claim 9 (with consequential renumbering) after current claim 7 (renumbered claim 8):

9. The apparatus of claim 8, wherein the uplink data-non-associated control signalling is multiplexed into a 180 kHz PRB.

Amend current claim 8 (renumbered 10):

- ~~8-10.~~ The apparatus of any of claims 78 to 9, wherein the orthogonal resources are within a semi-statically assigned time frequency region for UEs that transmit only L1/L2 control information ~~resource elements assigned for transmission of a physical uplink control channel (PUCCH).~~

Amend current claim 12 (renumbered claim 14):

- ~~12-14.~~ The apparatus of any of claims ~~78~~ to ~~113,~~ further comprising spreading using Hadamard spreading, performed with SF=4.