**3GPP TSG-RAN WG4 Meeting #111 *R4-2407996***

**Fukuoka, Japan, 20th - 24th May, 2024**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **36.102** | **CR** | **0036** | **rev** | **1** | **Current version:** | 18.5.0 |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network |  |

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| ***Title:*** | Update on definition of GEO | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | China Telecomunication Corp. | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | LTE\_NBIOT\_eMTC\_NTN\_req-Core | | | | |  | ***Date:*** | | | 2024-05-06 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | ***F*** |  | | | | | ***Release:*** | | | Rel-18 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | There are abbreviations on both GEO and GSO. However, there is no explicit definition on GSO which may cause confusion. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Definition on term of GSO is added.  Abbreviations of GEO and GSO are updated. | | | | | | | | |
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| ***Consequences if not approved:*** | | Confusion on defintion of GEO and GSO would be sitll exist. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 3.1,3.3 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

<Start of changes>

# 3 Definitions of terms, symbols and abbreviations

## 3.1 Terms

For the purposes of the present document, the terms given in TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in TR 21.905 [1].

**Channel edge:** The lowest and highest frequency of the carrier, separated by the channel bandwidth.

**Channel bandwidth:** The RF bandwidth supporting a single E-UTRA RF carrier with the transmission bandwidth configured in the uplink or downlink of a cell. The channel bandwidth is measured in MHz and is used as a reference for transmitter and receiver RF requirements.

**Category NB1/NB2 stand-alone operation**: category NB1/NB2 is operating standalone when it utilizes its own spectrum, for example the spectrum used by GERAN systems as a replacement of one or more GSM carriers, as well as scattered spectrum for potential IoT deployment.

**Category NB1/NB2** **guard band operation:** category NB1/NB2 is operating in guard band when it utilizes the unused resource block(s) within a E-UTRA carrier’s guard-band.

**Category NB1/NB2** **in-band operation:** category NB1/NB2 is operating in-band when it utilizes the resource block(s) within a normal E-UTRA carrier or within a normal NR carrier plus 15 kHz at each edge (and not within NR minimum guard band).

**Geostationary satellite:** A geosynchronous satellite whose circular and direct orbit lies in the plane of the Earth’s equator and which thus remains fixed relative to the Earth; by extension, a geosynchronous satellite which remains approximately fixed relative to the Earth.

**Geostationary-Satellite Orbit:** The orbit of a geosynchronous satellite whose circular and direct orbit lies in the plane of the Earth's equator.

**Geosynchronous Earth Orbit:** Earth-centred orbit at approximately 35786 kilometres above Earth's surface and synchronised with Earth's rotation. A geostationary orbit is a non-inclined geosynchronous orbit, i.e. in the Earth’s equator plane.

**Geosynchronous satellite:** An earth satellite whose period of revolution is equal to the period of rotation of the Earth about its axis.

**Low Earth Orbit:** Orbit around the Earth with an altitude between 300 km, and 1500 km.

**Satellite:** A space-borne vehicle embarking a bent pipe payload or a regenerative payload telecommunication transmitter, placed into Low-Earth Orbit (LEO), Medium-Earth Orbit (MEO), or Geosynchronous Earth Orbit (GEO).

**Satellite Access Node:** see definition in TS 36.108 [2].

**sTTI**: A transmission time interval (TTI) of either one slot or one subslot as defined in TS 36.211 [3] on either uplink or downlink.

## 3.2 Symbols

For the purposes of the present document, the following symbols apply:

ΔFRaster Band dependent channel raster granularity

BWChannel Channel bandwidth

F Frequency

FInterferer (offset) Frequency offset of the interferer (between the center frequency of the interferer and the carrier frequency of the carrier measured)

FInterferer Frequency of the interferer

FIoffset Frequency offset of the interferer (between the center frequency of the interferer and the closest edge of the carrier measured)

FC Frequency of the carrier centre frequency

FDL\_low The lowest frequency of the downlink operating band

FDL\_high The highest frequency of the downlink operating band

FUL\_low The lowest frequency of the uplink operating band

FUL\_high The highest frequency of the uplink operating band

FOOB The boundary between the E-UTRA out of band emission and spurious emission domains.

LCtone Transmission bandwidth which represents the length of a contiguous sub-carrier allocation expressed in units of tones

NDL Downlink EARFCN

NOffs-DL Offset used for calculating downlink EARFCN

NOffs-UL Offset used for calculating uplink EARFCN

NRB Transmission bandwidth configuration, expressed in units of resource blocks

NRB\_alloc Total number of simultaneously transmitted resource blocks in Channel bandwidth or Aggregated Channel Bandwidth.

Ntone Transmission bandwidth configuration for category NB1 and NB2, expressed in units of tones.

Ntone 3.75kHz Transmission bandwidth configuration for category NB1 and NB2 with 3.75 kHz sub-carrier spacing, expressed in units of tones.

Ntone 15kHz  Transmission bandwidth configuration for category NB1 and NB2 with 15 kHz sub-carrier spacing, expressed in units of tones.

NUL Uplink EARFCN.

PCMAX The configured maximum UE output power.

PInterferer Modulated mean power of the interferer

PPowerClass PPowerClass is the nominal UE power (i.e., no tolerance).

PPowerClass\_Default PPowerClass\_Default is the default nominal UE power (i.e., no tolerance) for the band.

PUMAX The measured configured maximum UE output power.

Puw Power of an unwanted DL signal

Pw Power of a wanted DL signal

ΔfOOB Δ Frequency of Out Of Band emission

## 3.3 Abbreviations

For the purposes of the present document, the abbreviations given in TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in TR 21.905 [1].

ACLR Adjacent Channel Leakage Ratio

ACS Adjacent Channel Selectivity

A-MPR Additional Maximum Power Reduction

AWGN Additive White Gaussian Noise

BW Bandwidth

CW Continuous Wave

DL Downlink

EARFCN E-UTRA Absolute Radio Frequency Channel Number

E-UTRA Evolved UMTS Terrestrial Radio Access

EUTRAN Evolved UMTS Terrestrial Radio Access Network

EVM Error Vector Magnitude

FDD Frequency Division Duplex

GEO Geosynchronous Earth Orbit

GSO Geostationary-Satellite Orbit

ITU-R Radiocommunication Sector of the International Telecommunication Union

LEO Low Earth Orbit

HD-FDD Half- Duplex FDD

MEO Medium Earth Orbit

MPR Maximum Power Reduction

NGSO Non-Geosynchronous Orbit

OCNG OFDMA Channel Noise Generator

OFDMA Orthogonal Frequency Division Multiple Access

OOB Out-of-band

QAM Quadrature Amplitude Modulation

RAN Radio Access Network

RE Resource Element

REFSENS Reference Sensitivity power level

RF Radio Frequency

UE User Equipment

UL Uplink

UMTS Universal Mobile Telecommunications System

UTRA UMTS Terrestrial Radio Access

UTRAN UMTS Terrestrial Radio Access Network

<End of changes>