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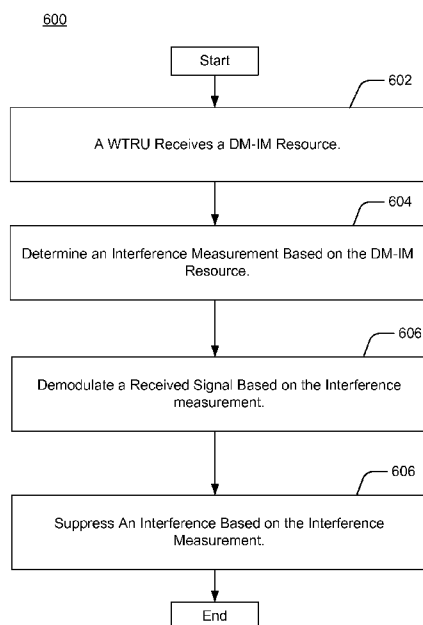
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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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(54) Title: METHODS, SYSTEMS AND APPARATUSES FOR NETWORK ASSISTED INTERFERENCE CANCELLATION AND/OR SUPPRESSION (NAICS) IN LONG TERM EVOLUTION (LTE) SYSTEMS



(57) Abstract: A method implemented by a Wireless Transmit/Receive Unit (WTRU) includes receiving a DeModulation Interference Measurement (DM-IM) resource, determining an interference measurement based on the DM-IM resource, and demodulating a received signal based on the interference measurement. An interference is suppressed based on the interference measurement. At least one DM-IM resource is located in a Physical Resource Block (PRB). The DM-IM resource is located in a PRB allocated for the WTRU. The DM-IM resource is a plurality of DM-IM resources which form a DM-IM pattern, and the DM-IM pattern is located on a Physical Downlink Shared Channel (PDSCH) and/or an enhanced Physical Downlink Shared Channel (E-PDSCH) of at least one Long Term Evolution (LTE) subframe. The DM-IM resources are different for different Physical Resource Blocks (PRB) in the LTE subframe. The DM-IM is located in a Long Term Evolution (LTE) Resource Block (RB), and the DM-IM pattern is adjusted.

FIG. 6



GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

(88) Date of publication of the international search report:

30 April 2015

Published:

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INTERNATIONAL SEARCH REPORT

International application No

PCT/US2014/036424

A. CLASSIFICATION OF SUBJECT MATTER
 INV. H04L5/00 H04B1/00 H04J11/00
 ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

H04L H04B H04J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	ZTE: "Consideration for network assisted receiver enhancement", 3GPP DRAFT; R1-131061 CONSIDERATION FOR NETWORK ASSISTED RECEIVER ENHANCEMENT, 3RD GENERATION PARTNERSHIP PROJECT (3GPP), MOBILE COMPETENCE CENTRE ; 650, ROUTE DES LUCIOLES ; F-06921 SOPHIA-ANTIPOLIS , vol. RAN WG1, no. Chicago, USA; 20130415 - 20130419 6 April 2013 (2013-04-06), XP050697029, Retrieved from the Internet: URL:http://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_72b/Docs/ [retrieved on 2013-04-06] page 1 - page 5 ----- -/--	1-18



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

24 July 2014

Date of mailing of the international search report

17/03/2015

Name and mailing address of the ISA/

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INTERNATIONAL SEARCH REPORT

International application No

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	SAMSUNG: "Discussion on NAICS Evaluation Assumptions", 3GPP DRAFT; R1-131040 DISCUSSION ON NAICS EVALUATION ASSUMPTIONS, 3RD GENERATION PARTNERSHIP PROJECT (3GPP), MOBILE COMPETENCE CENTRE ; 650, ROUTE DES LUCIOLES ; F-06921 SOPHIA-ANTIPOLIS CEDEX ; FRANC , vol. RAN WG1, no. Chicago; 20130415 - 20130419 5 April 2013 (2013-04-05), XP050696731, Retrieved from the Internet: URL:http://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_72b/Docs/ [retrieved on 2013-04-05] page 3	1-18
A	----- WO 2013/025558 A1 (INTERDIGITAL PATENT HOLDINGS [US]; LEE MOON-IL [US]; MARINIER PAUL [CA] 21 February 2013 (2013-02-21) paragraph [0117] - paragraph [0234] -----	1-18

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2014/036424

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of Item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-18

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-18

demodulating based on signaled interference measurement
resource

2. claims: 19, 20

informing UE about existence of co-scheduled UEs

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2014/036424

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2013025558 A1	21-02-2013	CN 103733676 A	16-04-2014
		EP 2742716 A1	18-06-2014
		JP 2014529945 A	13-11-2014
		KR 20140060303 A	19-05-2014
		KR 20140099917 A	13-08-2014
		TW 201322665 A	01-06-2013
		US 2013208604 A1	15-08-2013
		WO 2013025558 A1	21-02-2013
