

# (12) International Application Status Report

**Received at International Bureau:** 21 August 2017 (21.08.2017)

**Information valid as of:** 28 January 2019 (28.01.2019)

**Report generated on:** 21 September 2019 (21.09.2019)

**(10) Publication number:**

WO2019/028825

**(43) Publication date:**

14 February 2019 (14.02.2019)

**(26) Publication language:**

English (EN)

**(21) Application Number:**

PCT/CN2017/097057

**(22) Filing Date:**

11 August 2017 (11.08.2017)

**(25) Filing language:**

English (EN)

**(51) International Patent Classification:**

*H04W 52/02* (2009.01)

**(71) Applicant(s):**

QUALCOMM INCORPORATED [US/US]; ATTN: International IP Administration 5775 Morehouse Drive San Diego, California 92121-1714 (US) (*for all designated states*)

NAGARAJA, Sumeeth [IN/US]; 5775 Morehouse Drive San Diego, California 92121-1714 (US) (*US only*)

ANG, Peter [CA/US]; 5775 Morehouse Drive San Diego, California 92121-1714 (US) (*US only*)

HE, Linhai [US/US]; 5775 Morehouse Drive San Diego, California 92121-1714 (US) (*US only*)

CHENG, Peng [CN/CN]; 5775 Morehouse Drive San Diego, California 92121-1714 (US) (*US only*)

LUO, Tao [US/US]; 5775 Morehouse Drive San Diego, California 92121-1714 (US) (*US only*)

ISLAM, Muhammad Nazmul [BD/US]; 5775 Morehouse Drive San Diego, California 92121-1714 (US) (*US only*)

LUO, Jianghong [CN/US]; 5775 Morehouse Drive San Diego, California 92121-1714 (US) (*US only*)

**(72) Inventor(s):**

NAGARAJA, Sumeeth; 5775 Morehouse Drive San Diego, California 92121-1714 (US)

ANG, Peter; 5775 Morehouse Drive San Diego, California 92121-1714 (US)

HE, Linhai; 5775 Morehouse Drive San Diego, California 92121-1714 (US)

CHENG, Peng; 5775 Morehouse Drive San Diego, California 92121-1714 (US)

LUO, Tao; 5775 Morehouse Drive San Diego, California 92121-1714 (US)

ISLAM, Muhammad Nazmul; 5775 Morehouse Drive San Diego, California 92121-1714 (US)

LUO, Jianghong; 5775 Morehouse Drive San Diego, California 92121-1714 (US)

**(74) Agent(s):**

NTD PATENT & TRADEMARK AGENCY LIMITED; 10th Floor, Tower C, Beijing Global Trade Center 36 North Third Ring Road East, Dongcheng District Beijing 100013 (CN)

**(54) Title (EN):** TECHNIQUES AND APPARATUSES FOR WAKEUP SIGNALING IN A MULTI-BEAM SYSTEM

**(54) Title (FR):** TECHNIQUES ET APPAREILS UTILISÉS POUR UNE SIGNALISATION DE RÉVEIL DANS UN SYSTÈME MULTI-FAISCEAU

**(57) Abstract:**

**(EN):** In some cases, a user equipment (UE) may communicate with a base station using one or more beams, such as in a millimeter wave system. This increases the complexity associated with transmission and reception of advanced grant indications (AGIs) because there are multiple possible beams via which an AGI could be transmitted and/or received, channel conditions of different beams may change over time (e.g., due to UE mobility, beam load, and/or the like), the UE and/or base station may have different capabilities with respect to communications using multiple beams, and/or the like. Some techniques and apparatuses described herein assist with transmission and reception of AGIs in multi-beam wireless communication systems. Some techniques and apparatuses described herein increase a likelihood of successful communication of AGIs, which consequently conserves UE battery power.

**(FR):** Dans certains cas, un équipement d'utilisateur (UE) peut communiquer avec une station de base à l'aide d'un ou plusieurs faisceaux, comme dans un système à ondes millimétriques par exemple. Cela augmente la complexité associée à la transmission et à la réception d'indications d'autorisation avancée (AGI) étant donné qu'une AGI peut être transmise et/ou reçue via plusieurs faisceaux possibles, que des conditions de canal de différents faisceaux peuvent changer au fil du temps (en raison de la mobilité de l'UE, de la charge du faisceau par ex., et/ou similaires), que l'UE et/ou la station de base peuvent avoir des capacités différentes par

rapport à des communications à l'aide de multiples faisceaux, et/ou similaires. Certaines techniques et appareils décrits ici facilitent la transmission et la réception d'AGI dans des systèmes de communication sans fil multi-faisceau. Certaines techniques et appareils décrits ici augmentent la probabilité de communications d'AGI réussies, ce qui permet d'économiser l'énergie de la batterie d'un UE.

**International search report:**

Received at International Bureau: 03 May 2018 (03.05.2018) [CN]

**International Report on Patentability (IPRP) Chapter II of the PCT:**

Not available

**(81) Designated States:**

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, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, 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

European Patent Office (EPO) : 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

African Intellectual Property Organization (OAPI) : BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG

African Regional Intellectual Property Organization (ARIPO) : BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW

Eurasian Patent Organization (EAPO) : AM, AZ, BY, KG, KZ, RU, TJ, TM

**Declarations:**

Declaration of inventorship (Rules 4.17(iv) and 51bis.1(a)(iv)) for the purposes of the designation of the United States of America