

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
22 February 2018 (22.02.2018)



(10) International Publication Number
WO 2018/034869 A1

- (51) **International Patent Classification:**
H04L 5/00 (2006.01) *H04L 27/26* (2006.01)
- (21) **International Application Number:**
PCT/US2017/045525
- (22) **International Filing Date:**
04 August 2017 (04.08.2017)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**
62/377,522 19 August 2016 (19.08.2016) US
15/603,158 23 May 2017 (23.05.2017) US
- (71) **Applicant: QUALCOMM INCORPORATED** [US/US];
ATTN: International IP Administration, 5775 Morehouse
Drive, San Diego, California 92121-1714 (US).
- (72) **Inventors: YANG, Yang;** 5775 Morehouse Drive, San
Diego, California 92121-1714 (US). **JIANG, Jing;** 5775
Morehouse Drive, San Diego, California 92121-1714 (US).

- MANOLAKOS, Alexandros;** 5775 Morehouse Drive, San
Diego, California 92121-1714 (US). **LUO, Tao;** 5775
Morehouse Drive, San Diego, California 92121-1714 (US).
- (74) **Agent: ANDERSON, Thomas D.;** Holland & Hart LLP,
P.O. Box 11583, Salt Lake City, Utah 84147 (US).
- (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, 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.
- (84) **Designated States** (*unless otherwise indicated, for every
kind of regional protection available*): ARIPO (BW, GH,
GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ,

(54) **Title:** CONTROL CHANNEL WITH FLEXIBLE NUMEROLOGY

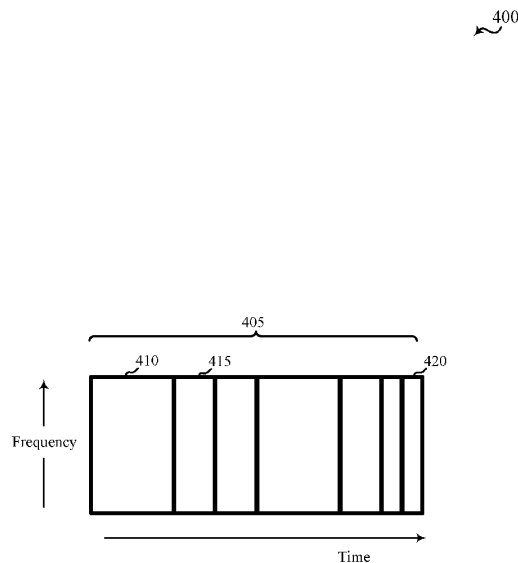


FIG. 4

(57) **Abstract:** Techniques are described for wireless communication. One method for wireless communication includes transmitting, to a user equipment (UE), an indication of a control channel subcarrier spacing to be used by the UE; and transmitting a control message having a subcarrier spacing in accordance with the indication. Another method for wireless communication includes transmitting, to a UE, an indicator channel identifying at least a subcarrier spacing to be used in one or more subsequent control channels. One or more subsequent control channels are then transmitted in accordance with the subcarrier spacing indicated by the indicator channel.

[Continued on next page]



WO 2018/034869 A1

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).

Declarations under Rule 4.17:

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*
- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

Published:

- *with international search report (Art. 21(3))*
- *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))*