Appeal decision

Appeal No. 2017-5678

U.S.A
Appellant Qualcomm Incorporated

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The case of appeal against the examiner's decision of refusal of Japanese Patent Application No. 2015-61015, entitled "METHODS AND APPARATUSES FOR USING CHANNEL STATE INFORMATION REFERENCE SIGNALS" (the application published on September 10, 2015, Japanese Unexamined Patent Application Publication No. 2015-164306, (4) claims) has resulted in the following appeal decision.

Conclusion

The examiner's decision is revoked.

The Invention of the present application shall be granted a patent.

Reason

No. 1 History of the procedures

The present application is a divisional application filed on March 24, 2015 from Japanese Patent Application No. 2013-509236 filed on May 4, 2011 as an international filing date (priority claim under the Paris Convention: May 4, 2010, US, May 3, 2011, US). A notice of the reasons for refusal was issued as of February 9, 2016, an amendment was made on July 19, 2016, and the examiner's decision of refusal was issued on December 14, 2016. Against this, an appeal against the examiner's decision of refusal was requested on April 20, 2017.

No. 2 Outline of the examiner's decision

The outline of the examiner's decision (examiner's decision of refusal as of December 14, 2016) is as follows.

The invention according to Claims 1 to 4 could be easily made by a person who has ordinary skill in the technical field to which the invention belongs (hereinafter referred to as "a person skilled in the art"), on the basis of the following Cited documents 1 and 2, and the Appellant should not be granted a patent under the

provisions of Article 29(2) of the Patent Act.

List of the Cited documents, etc.
1. NTT DOCOMO, DL RS Design for LTE-Advanced, 3GPP TSG-RAN WG1#56b R1-091483, March 18, 2009, pp. 1-6
2. International Publication No. WO2010/006285

No. 3 Regarding the Invention

The inventions (hereinafter referred to as "Invention 1" to "Invention 4") according to Claims 1 to 4 are inventions specified by the matters described in Claims 1 to 4 of the scope of claims amended by the amendment on July 19, 2016. Invention 1 is as follows.

"[Claim 1]

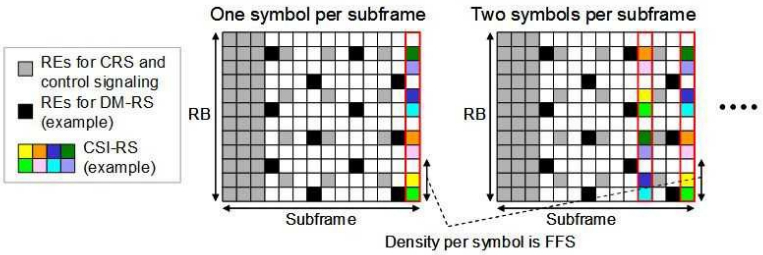
Wireless communication method, comprising: allocating a first resource element pattern for a first antenna port index for transmission of a reference signal to at least one user equipment, wherein the reference signal includes a channel state information reference signal (CSI-RS); and

allocating a second resource element pattern for a second antenna port index for transmission of the reference signal to at least one relay node, wherein the second resource element pattern is non-overlapping with the first resource element pattern since the first antenna port index is different from the second antenna port index."

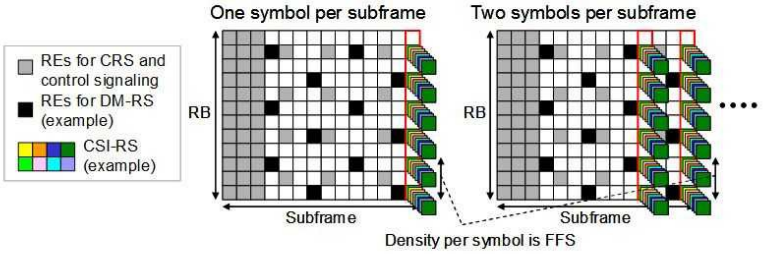
Inventions 2 to 4 are inventions of a wireless communication apparatus, a program, and a processor for wireless communication, corresponding to Invention 1, respectively, and are substantially different from Invention 1 only in category expression.

No. 4 Cited documents, Cited inventions
1. Regarding Cited Document 1

In Cited Document 1 cited in the reasons for refusal of the examiner's decision, the following matters are described with drawings.
"3.2. CSI-RS
In Section 2, we mentioned that the insertion interval of subframes with a CSI-RS should be similar to that for the UL SRS. Here, we discuss a scheme to multiplex CSI-RS into the subframe. Figures 4(a) and 4(b) show examples of the CSI-RS multiplexing scheme for up to eight antenna ports (Note that the gain from introducing inter-cell orthogonality is FFS). We basically consider multiplexing of CSI-RS into OFDM symbols for the PDSCH which is not overlapped with those including other types of RSs such as CRS or DM-RS. Furthermore, we consider FDM and/or CDM as orthogonal multiplexing schemes for CSI- RSs belonging to different antenna ports.



(a) FDM



(b) CDM

Figure 4 – Examples of CSI-RS structures

An additional issue to be investigated is backward compatibility to Rel-8 LTE UEs. If RBs with the CSI-RS are assigned to Rel-8 LTE UEs, performance degradation is expected. To address this problem, two options are considered.
* Delegate the issue to eNB scheduling - implementation matter [9]
* CSI-RS multiplexing only into RBs scheduled for LTE-Advanced UEs - some specifications may be needed to indicate the RBs with CSI-RS to LTE-Advanced UEs"
(Page 3, line 1 to Page 4, line 6)

(1) Cited Invention 1 relates, as the name of the document suggests, to a downlink RS (reference signal) design for LTE-advanced. "3. 2. CRI-RS" describes CSI-RS allocation to subframes. Therefore, Cited Document 1 describes a "wireless communication method for CSI-RS transmission."

(2) According to the description in "Figures 4(a) and 4(b) show examples of the CSI-RS multiplexing scheme for up to 8 antenna ports" in "3. 2. CSI-RS" of the Cited Invention 1, Cited Document 1 describes "using 8 antenna ports for CSI-RS transmission."

(3) The right figure in FIG. 4(a) of the Cited invention 1 illustrates allocating CSI-RSs to each of two symbols in a subframe. The two symbols are located at different positions on the subframe, and it is obvious that the CSI-RSs arranged in the two symbols do not overlap each other.

The figure shows allocating CSI-RSs to 8 REs of 12 REs constituting each of the symbols.

Therefore, Cited Document 1 describes "allocating CSI-RSs to two symbols in one subframe, and allocating the CSI-RSs to 8 REs of 12 REs constituting each of the symbols, wherein the CSI-RSs allocated to the two symbols do not overlap each other."

According to the above (1) to (3), Cited Document 1 is recognized to describe

the following invention (hereinafter referred to as "Cited Invention").

"A wireless communication method for CSI-RS transmission that uses 8 antenna ports for CSI-RS transmission,

characterized by

allocating CSI-RSs to two symbols in one subframe, and allocating the CSI-RSs to 8 REs of 12 REs constituting each of the symbols, wherein the CSI-RSs allocated to the two symbols do not overlap each other."

2. Regarding Cited Document 2

In Cited Document 2 cited in the reasons for refusal of the examiner's decision, the following matters are described with drawings. (Underlines were added by the body.)

"[0073] FIG. 6 shows a design of a process 600 for mitigating interference in a wireless communication network. Process 600 may be performed by a UE, a base station/eNB, a relay station, or some other entity. A first station causing high interference to or observing high interference from a second station in a heterogeneous network may be identified (block 612). The heterogeneous network may comprise base stations of at least two different transmit power levels and/or different association types. Interference due to a first reference signal from the first station may be mitigated by canceling the interference at the second station, or interference to the first reference signal may be mitigated by selecting different resources for sending a second reference signal by the second station to avoid collision with the first reference signal (block 614).

[0074] In one design, the first station may be a base station or a relay station, and the second station may be a UE. For block 614, the interference due to the first reference signal may be canceled at the UE. In one design, the interference due to the first reference signal may be estimated and subtracted from a received signal at the UE to obtain an interference-canceled signal. The interference-canceled signal may then be processed to obtain a channel estimate for a base station or a relay station with which the UE is in communication. The interference-canceled signal may also be processed to obtain data and/or control information sent by the base station or the relay station to the UE." (Page 18, line 17 to Page 19, line 2)

According to the above description (especially the portions underlined), Cited Document 2 describes the technical matter, "selecting different resources for sending a second reference signal by a UE to mitigate interference to a first reference signal from a base station."

No. 5 Comparison/Judgment

1. Regarding Claim 1

(1) "RE" in the Cited Invention corresponds to the "resource element" in Invention 1.

(2) In the Cited Invention, the CSI-RSs are allocated to 8 REs of 12 REs constituting each of symbols in a subframe. Therefore, it can be said that the "8 REs" constitute "RE (resource element) pattern" for transmitting the CSI-RS.

In the Cited Invention, the CSI-RSs are allocated to 8 REs in each of two symbols. It can be said that the Cited invention includes two "RE patterns" for transmitting the CSI-RSs, a first RS pattern and a second RS pattern.

Thus, the Cited Invention corresponds to Invention 1 in the points of including a "first resource element pattern" "for transmitting a reference signal," "wherein the reference signal includes a channel state information reference signal (CSI-RS)," and including a "second resource element pattern" "for transmitting the reference signal."

Therefore, the Invention and the Cited Invention are identical and different in the following points.

(Corresponding features)

"Wireless communication method, comprising:

a first resource element pattern for transmissions of a reference signal, wherein the reference signal includes a channel state information reference signal (CSI-RS); and

a second resource element pattern for transmissions of the reference signal, wherein the second resource element pattern is non-overlapping with the first resource element pattern."

(Different features)

(Different Feature 1) In Invention 1, the "first resource element pattern" is allocated to at least one user equipment and the "second resource element pattern" is allocated to at least one relay node. The Cited Invention does not specify a device to which RE pattern in each symbol is allocated.

(Different Feature 2) In Invention 1, the first resource element pattern is "for a first antenna port index" for transmission of the reference signal. The Cited Invention does not specify that the resource element pattern is "for a first antenna port index."

The same applies to the second resource element pattern.

(Different Feature 3)The second resource element pattern is non-overlapping with the first resource element pattern, since "the first antenna port index is different from the second antenna port index" in Invention 1, while the Cited document does not specify the above matter.

In examining Different Feature 1, Cited Document 2 does not describe, regarding RE (resource element) patterns for transmitting a reference signal including RSI-CS, that the first RE pattern is allocated to a user equipment and the second RE pattern is allocated to a relay node, and it cannot be said that the configuration was well-known as of the priority date of the application.

As described in "No. 4 Cited documents, Cited inventions" "2. Regarding Cited Document 2", Cited Document 2 describes the technical matter, "selecting different resources for sending a second reference signal by a UE to mitigate interference to a first reference signal from a base station." The "second reference signal" is transmitted i.e. “sent” by a UE, and serves as an uplink reference signal.

The CSI-RS in Invention 1 and Cited Invention is a downlink reference signal which is transmitted by a base station toward a UE or a relay node.

Therefore, when the technical matters described in Cited Document 2 are applied to the Cited Invention, even if a person skilled in the art easily conceives of making a configuration of selecting a plurality of resources different from a downlink reference signal transmitted by a base station, as a resource of an uplink reference signal transmitted by a UE, in the Cited Invention, it cannot be said that a person skilled in the art can easily conceive of making a configuration of allocating a first RE pattern to a user device and a second RE pattern to a relay node, of the RE (resource element) patterns for transmitting a reference signal including CSI-RS, which is a downlink reference signal.

Thus, it cannot be said that Invention 1 could be easily made by a person skilled in the art on the basis of the Cited Invention and the technical matters described in Cited Document 2, without examining other differences.

2. Regarding Claims 2 to 4

Inventions 2 to 4 are inventions of a device for wireless communication corresponding to Invention 1, a program, and a processor for wireless communication, respectively, and comprise the same configuration as Invention 1, "allocating a first resource element pattern to at least one user device" and "allocating a second resource element pattern to at least one relay node." For the same reasons as for Invention 1, it cannot be said that Inventions 2 to 4 could be easily made by a person skilled in the art on the basis of the Cited Invention and the technical matters described in Cited Document 2.

No. 6 Closing

As described above, Inventions 1 to 4 could not be easily made by a person skilled in the art on the basis of the Cited Invention and the technical matters described in Cited Document 2. Thus, the application cannot be rejected due to the reasons of the examiner's decision.

In addition, beyond that, no reasons for refusal were found.

Therefore, the appeal decision shall be made as described in the conclusion.

March 19, 2018

Chief administrative judge: YOSHIDA, Takayuki
Administrative judge: TAMAKI, Koji
Administrative judge: YAMANAKA, Minoru