

[CLAIMS]

[Claim 1]

A mobile communication system in which a mobile station performs communication
5 while moving, the mobile communication system comprising:
a mobile station that is provided in a moving object moving along a predetermined route;
and
a plurality of base stations provided along the route, wherein each of the plurality of base
stations performs wireless communication with the mobile station through a same
10 channel of a same frequency band,
wherein the mobile station comprises:
a base station selection unit that repeatedly selects two base stations, with which the
mobile station simultaneously communicates, among the plurality of base stations,
sequentially;
15 a first selected base station determination unit that compares base stations selected by the
base station selection unit at this time with base stations selected by the base station
selection unit at a previous time and determines whether there is a first base station
selected at the previous time and not selected at this time;
a second selected base station determination unit that compares the base stations selected
20 by the base station selection unit at this time with the base stations selected by the base
station selection unit at the previous time and determines whether there is a second base
station not selected at the previous time and selected at this time;
an inhibition command data transmission unit that transmits data for commanding
inhibition of a downlink to the first base station when the first selected base station
25 determination unit determines that the first base station is selected at the previous time

and is not selected at this time; and

a permission command data transmission unit that transmits data for commanding permission of a downlink to the second base station when the second selected base station determination unit determines that the second base station is not selected at the
5 previous time and is selected at this time.

[Claim 2]

The mobile communication system according to claim 1, wherein, when there is the mobile station in an area in which a communication range of one base station of
10 geographically adjacent two base stations among the plurality of base stations and a communication range of the other base station of the geographically adjacent two base stations among the plurality of base stations overlap each other, the geographically adjacent two base stations are disposed such that a difference between a distance from the one base station to the mobile station and a distance from the other base station to the mobile station is smaller than a distance to which a radio wave propagates for a time
15 corresponding to a length of a guard interval of data simultaneously transmitted from the geographically adjacent two base stations.

[Claim 3]

The mobile communication system according to claim 1, wherein, when there is the mobile station in an area in which a communication range of one base station of
20 geographically adjacent two base stations among the plurality of base stations and a communication range of the other base station of the geographically adjacent two base stations among the plurality of base stations overlap each other, the geographically adjacent two base stations are disposed such that a difference between a distance from the one base station to the mobile station and a distance from the other base station to the
25 mobile station is smaller than a distance to which a radio wave propagates for a time

required for switching a state of using a spread code designated in the one base station to a state of using a spread code designated in the other base station.

[Claim 4]

A mobile communication method in which a mobile station performs communication

5 while moving, the mobile communication method comprising:

a base station selection step in which a mobile station provided in a moving object moving along a predetermined route repeatedly selects two base stations, with which the mobile station simultaneously communicates, among a plurality of base stations, which are provided along the route and each perform wireless communication with the mobile

10 station through a same channel of a same frequency band, sequentially;

a first selected base station determination step in which the mobile station compares base stations selected at this time in the base station selection step with base stations selected at a previous time in the base station selection step and determines whether there is a first base station selected at the previous time and not selected at this time;

15 a second selected base station determination step in which the mobile station compares the base stations selected at this time in the base station selection step with the base stations selected at the previous time in the base station selection step and determines whether there is a second base station not selected at the previous time and selected at this time;

20 an inhibition command data transmission step in which, when it is determined in the first selected base station determination step that the first base station is selected at the previous time and is not selected at this time, the mobile station transmits data for commanding inhibition of a downlink to the first base station; and

a permission command data transmission step in which, when it is determined in the
25 second selected base station determination step that the second base station is not

selected at the previous time and is selected at this time, the mobile station transmits data for commanding permission of a downlink to the second base station.

[Claim 5]

A mobile station provided in a moving object moving along a predetermined route, the

5 mobile station comprising:

a base station selection unit that repeatedly selects two base stations, with which the mobile station simultaneously communicates, among a plurality of base stations, which are provided along the route and each perform wireless communication with the mobile station through a same channel of a same frequency band, sequentially;

10 a first selected base station determination unit that compares base stations selected by the base station selection unit at this time with base stations selected by the base station selection unit at a previous time and determines whether there is a first base station selected at the previous time and not selected at this time;

15 a second selected base station determination unit that compares the base stations selected by the base station selection unit at this time with the base stations selected by the base station selection unit at the previous time and determines whether there is a second base station not selected at the previous time and selected at this time;

20 an inhibition command data transmission unit that transmits data for commanding inhibition of a downlink to the first base station when the first selected base station determination unit determines that the first base station is selected at the previous time and is not selected at this time; and

25 a permission command data transmission unit that transmits data for commanding permission of a downlink to the second base station when the second selected base station determination unit determines that the second base station is not selected at the previous time and is selected at this time.

[Claim 6]

A program, which causes a computer to serve as a mobile station provided in a moving object moving along a predetermined route, causes the computer to serve as

a base station selection unit that repeatedly selects two base stations, with which the

5 mobile station simultaneously communicates, among a plurality of base stations, which are provided along the route and each perform wireless communication with the mobile station through a same channel of a same frequency band, sequentially,

a first selected base station determination unit that compares base stations selected by the base station selection unit at this time with base stations selected by the base station

10 selection unit at a previous time and determines whether there is a first base station selected at the previous time and not selected at this time,

a second selected base station determination unit that compares the base stations selected by the base station selection unit at this time with the base stations selected by the base station selection unit at the previous time and determines whether there is a second base

15 station not selected at the previous time and selected at this time,

an inhibition command data transmission unit that transmits data for commanding inhibition of a downlink to the first base station when the first selected base station determination unit determines that the first base station is selected at the previous time and is not selected at this time, and

20 a permission command data transmission unit that transmits data for commanding permission of a downlink to the second base station when the second selected base station determination unit determines that the second base station is not selected at the previous time and is selected at this time.

[Claim 7]

25 A recording medium, which records a program that causes a computer to serve as a

mobile station provided in a moving object moving along a predetermined route, records the program that causes the computer to serve as

a base station selection unit that repeatedly selects two base stations, with which the mobile station simultaneously communicates, among a plurality of base stations, which

5 are provided along the route and each perform wireless communication with the mobile station through a same channel of a same frequency band, sequentially,

a first selected base station determination unit that compares base stations selected by the base station selection unit at this time with base stations selected by the base station selection unit at a previous time and determines whether there is a first base station

10 selected at the previous time and not selected at this time,

a second selected base station determination unit that compares the base stations selected by the base station selection unit at this time with the base stations selected by the base station selection unit at the previous time and determines whether there is a second base station not selected at the previous time and selected at this time,

15 an inhibition command data transmission unit that transmits data for commanding inhibition of a downlink to the first base station when the first selected base station determination unit determines that the first base station is selected at the previous time and is not selected at this time, and

a permission command data transmission unit that transmits data for commanding

20 permission of a downlink to the second base station when the second selected base station determination unit determines that the second base station is not selected at the previous time and is selected at this time.

[CLAIMS]

[Claim 1]

A mobile communication system in which a mobile station performs communication

5 while moving, the mobile communication system comprising:

a mobile station that is provided in a moving object moving along a predetermined route;

and

a plurality of base stations provided along the route, wherein each of the plurality of base stations performs wireless communication with the mobile station through a same

10 channel of a same frequency band,

wherein the mobile station comprises:

a base station selection unit that repeatedly selects two base stations, with which the mobile station simultaneously communicates, among the plurality of base stations, sequentially;

15 a first selected base station determination unit that compares base stations selected by the base station selection unit at this time with base stations selected by the base station selection unit at a previous time and determines whether there is a first base station selected at the previous time and not selected at this time;

a second selected base station determination unit that compares the base stations selected
20 by the base station selection unit at this time with the base stations selected by the base station selection unit at the previous time and determines whether there is a second base station not selected at the previous time and selected at this time;

an inhibition command data transmission unit that transmits data for commanding inhibition of a downlink to the first base station when the first selected base station

25 determination unit determines that the first base station is selected at the previous time

and is not selected at this time; and

a permission command data transmission unit that transmits data for commanding permission of a downlink to the second base station when the second selected base station determination unit determines that the second base station is not selected at the previous time and is selected at this time.

[Claim 2]

The mobile communication system according to claim 1, wherein, when there is the mobile station in an area in which a communication range of one base station of geographically adjacent two base stations among the plurality of base stations and a communication range of the other base station of the geographically adjacent two base stations among the plurality of base stations overlap each other, the geographically adjacent two base stations are disposed such that a difference between a distance from the one base station to the mobile station and a distance from the other base station to the mobile station is smaller than a distance to which a radio wave propagates for a time corresponding to a length of a guard interval of data simultaneously transmitted from the geographically adjacent two base stations.

[Claim 3]

The mobile communication system according to claim 1, wherein, when there is the mobile station in an area in which a communication range of one base station of geographically adjacent two base stations among the plurality of base stations and a communication range of the other base station of the geographically adjacent two base stations among the plurality of base stations overlap each other, the geographically adjacent two base stations are disposed such that a difference between a distance from the one base station to the mobile station and a distance from the other base station to the mobile station is smaller than a distance to which a radio wave propagates for a time

required for switching a state of using a spread code designated in the one base station to a state of using a spread code designated in the other base station.

[Claim 4]

A mobile communication method in which a mobile station performs communication

5 while moving, the mobile communication method comprising:

a base station selection step in which a mobile station provided in a moving object moving along a predetermined route repeatedly selects two base stations, with which the mobile station simultaneously communicates, among a plurality of base stations, which are provided along the route and each perform wireless communication with the mobile

10 station through a same channel of a same frequency band, sequentially;

a first selected base station determination step in which the mobile station compares base stations selected at this time in the base station selection step with base stations selected at a previous time in the base station selection step and determines whether there is a first base station selected at the previous time and not selected at this time;

15 a second selected base station determination step in which the mobile station compares the base stations selected at this time in the base station selection step with the base stations selected at the previous time in the base station selection step and determines whether there is a second base station not selected at the previous time and selected at this time;

20 an inhibition command data transmission step in which, when it is determined in the first selected base station determination step that the first base station is selected at the previous time and is not selected at this time, the mobile station transmits data for commanding inhibition of a downlink to the first base station; and

a permission command data transmission step in which, when it is determined in the
25 second selected base station determination step that the second base station is not

selected at the previous time and is selected at this time, the mobile station transmits data for commanding permission of a downlink to the second base station.

[Claim 5]

A mobile station provided in a moving object moving along a predetermined route, the

5 mobile station comprising:

a base station selection unit that repeatedly selects two base stations, with which the mobile station simultaneously communicates, among a plurality of base stations, which are provided along the route and each perform wireless communication with the mobile station through a same channel of a same frequency band, sequentially;

10 a first selected base station determination unit that compares base stations selected by the base station selection unit at this time with base stations selected by the base station selection unit at a previous time and determines whether there is a first base station selected at the previous time and not selected at this time;

a second selected base station determination unit that compares the base stations selected
15 by the base station selection unit at this time with the base stations selected by the base station selection unit at the previous time and determines whether there is a second base station not selected at the previous time and selected at this time;

an inhibition command data transmission unit that transmits data for commanding inhibition of a downlink to the first base station when the first selected base station
20 determination unit determines that the first base station is selected at the previous time and is not selected at this time; and

a permission command data transmission unit that transmits data for commanding permission of a downlink to the second base station when the second selected base station determination unit determines that the second base station is not selected at the
25 previous time and is selected at this time.

[Claim 6]

A non-transitory recording medium, which records a program that causes a computer to serve as a mobile station provided in a moving object moving along a predetermined route, records the program that causes the computer to serve as

- 5 a base station selection unit that repeatedly selects two base stations, with which the mobile station simultaneously communicates, among a plurality of base stations, which are provided along the route and each perform wireless communication with the mobile station through a same channel of a same frequency band, sequentially,
a first selected base station determination unit that compares base stations selected by the
10 base station selection unit at this time with base stations selected by the base station selection unit at a previous time and determines whether there is a first base station selected at the previous time and not selected at this time,
a second selected base station determination unit that compares the base stations selected by the base station selection unit at this time with the base stations selected by the base
15 station selection unit at the previous time and determines whether there is a second base station not selected at the previous time and selected at this time,
an inhibition command data transmission unit that transmits data for commanding inhibition of a downlink to the first base station when the first selected base station determination unit determines that the first base station is selected at the previous time
20 and is not selected at this time, and
a permission command data transmission unit that transmits data for commanding permission of a downlink to the second base station when the second selected base station determination unit determines that the second base station is not selected at the previous time and is selected at this time.