

## CLAIMS

1. An OFDM signal generation method of a transmission system, the transmission system having a first transmitter and a second transmitter, the OFDM signal generating method comprising:
  - modulating, by the first transmitter, each of a plurality of coded blocks to a first modulated signal s1, the coded blocks each made up of a plurality of bits by using a determined error correction block coding scheme;
  - modulating, by the second transmitter, each of the coded blocks to a second modulated signal s2, data included in the first modulated signal s1 being same as data included in the second modulated signal s2;
  - inserting, by the first transmitter, one or more pilots to the first modulated signal s1 to obtain a first pilot-inserted signal s1';
  - inserting, by the second transmitter, the one or more pilots to the second modulated signal s2 to obtain a second pilot-inserted signal s2';
  - phase-changing, by the first transmitter, while regularly varying a first scheme of phase change for each of a plurality of slots, the first pilot-inserted signal s1' to obtain a first transmission signal z1;
  - phase-changing, by the second transmitter, while regularly varying a second scheme of phase change for each of the plurality of slots, the second pilot-inserted signal s2' to obtain a second transmission signal z2;
  - converting, by the first transmitter, the first transmission signal z1 to a first OFDM signal;
  - converting, by the second transmitter, the second transmission signal z2 to a second OFDM signal;
  - inserting, by the first transmitter, a part of the first OFDM signal to the first OFDM signal to be transmitted from a first antenna at a first period at a first frequency; and
  - inserting, by the second transmitter, a part of the second OFDM signal to the second OFDM signal to be transmitted from a second antenna at the first period at the first frequency.
2. An OFDM signal generation system comprising:
  - a first OFDM signal generator; and
  - a second OFDM signal generator,wherein the first OFDM signal generator, in operation,

modulates each of a plurality of coded blocks to a first modulated signal s1, the coded blocks each made up of a plurality of bits by using a determined error correction block coding scheme;

inserts one or more pilots to the first modulated signal s1 to obtain a first pilot-inserted signal s1';

phase-changes, while regularly varying a first scheme of phase change for each of a plurality of slots, the first pilot-inserted signal s1' to obtain a first transmission signal z1;

converts the first transmission signal z1 to a first OFDM signal;

inserts a part of the first OFDM signal to the first OFDM signal to be transmitted from a first antenna at a first period at a first frequency; and

wherein the second OFDM signal generator, in operation,

modulates each of the coded blocks to a second modulated signal s2, data included in the first modulated signal s1 being same as data included in the second modulated signal s2;

inserts the one or more pilots to the second modulated signal s2 to obtain a second pilot-inserted signal s2';

phase-changes, while regularly varying a second scheme of phase change for each of the plurality of slots, the second pilot-inserted signal s2' to obtain a second transmission signal z2;

converts the second transmission signal z2 to a second OFDM signal; and

inserts a part of the second OFDM signal to the second OFDM signal to be transmitted from a second antenna at the first period at the first frequency.

3. A reception data generation method of a reception apparatus, the method comprising:

acquiring a reception signal obtained by converting a first OFDM signal transmitted from a first antenna of a first transmitter at a first period at a first frequency and a second OFDM signal transmitted from a second antenna of a second transmitter at the first period at the first frequency, the first OFDM signal and the second OFDM signal having been generated through a determined generation process; and

demodulating the reception signal to reception data, through a demodulation process corresponding to the determined generation process, wherein

at least one of the acquiring and the demodulating is performed by the reception apparatus, and

the determined generation process is a process of:

modulating, by the first transmitter, each of a plurality of coded blocks to a first modulated signal  $s_1$ , the coded blocks each made up of a plurality of bits by using a determined error correction block coding scheme;

modulating, by the second transmitter, each of the coded blocks to a second modulated signal  $s_2$ , data included in the first modulated signal  $s_1$  being same as data included in the second modulated signal  $s_2$ ;

inserting, by the first transmitter, one or more pilots to the first modulated signal  $s_1$  to obtain a first pilot-inserted signal  $s_1'$ ;

inserting, by the second transmitter, the one or more pilots to the second modulated signal  $s_2$  to obtain a second pilot-inserted signal  $s_2'$ ;

phase-changing, by the first transmitter, while regularly varying a first scheme of phase change for each of a plurality of slots, the first pilot-inserted signal  $s_1'$  to obtain a first transmission signal  $z_1$ ;

phase-changing, by the second transmitter, while regularly varying a second scheme of phase change for each of the plurality of slots, the second pilot-inserted signal  $s_2'$  to obtain a second transmission signal  $z_2$ ;

converting, by the first transmitter, the first transmission signal  $z_1$  to the first OFDM signal;

converting, by the second transmitter, the second transmission signal  $z_2$  to the second OFDM signal;

inserting, by the first transmitter, a part of the first OFDM signal to the first OFDM signal to be transmitted from the first antenna at the first period at the first frequency; and

inserting, by the second transmitter, a part of the second OFDM signal to the second OFDM signal to be transmitted from the second antenna at the first period at the first frequency.

4. A reception data generation apparatus comprising:

a memory; and

control circuitry,

wherein the control circuitry, in operation, performs the steps of:

acquiring a reception signal obtained by converting a first OFDM signal transmitted from a first antenna of a first transmitter at a first period at a first frequency and a second OFDM signal transmitted from a second antenna of a second transmitter at the first period at the first frequency, the first OFDM signal and the second OFDM signal having been generated through a determined generation process; and

demodulating the reception signal to reception data, through a demodulation process corresponding to the determined generation process, wherein

at least one of the acquiring and the demodulating is performed by the control circuitry, and

the determined generation process is a process of:

modulating, by the first transmitter, each of a plurality of coded blocks to a first modulated signal  $s_1$ , the coded blocks each made up of a plurality of bits by using a determined error correction block coding scheme;

modulating, by the second transmitter, each of the coded blocks to a second modulated signal  $s_2$ , data included in the first modulated signal  $s_1$  being same as data included in the second modulated signal  $s_2$ ;

inserting, by the first transmitter, one or more pilots to the first modulated signal  $s_1$  to obtain a first pilot-inserted signal  $s_1'$ ;

inserting, by the second transmitter, the one or more pilots to the second modulated signal  $s_2$  to obtain a second pilot-inserted signal  $s_2'$ ;

phase-changing, by the first transmitter, while regularly varying a first scheme of phase change for each of a plurality of slots, the first pilot-inserted signal  $s_1'$  to obtain a first transmission signal  $z_1$ ;

phase-changing, by the second transmitter, while regularly varying a second scheme of phase change for each of the plurality of slots, the second pilot-inserted signal  $s_2'$  to obtain a second transmission signal  $z_2$ ;

converting, by the first transmitter, the first transmission signal  $z_1$  to the first OFDM signal;

converting, by the second transmitter, the second transmission signal  $z_2$  to the second OFDM signal;

inserting, by the first transmitter, a part of the first OFDM signal to the first OFDM signal to be transmitted from the first antenna at the first period at the first frequency; and

inserting, by the second transmitter, a part of the second OFDM signal to the second OFDM signal to be transmitted from the second antenna at the first period at the first frequency.