CLAIMS

What is claimed is:

1. A base station in a RRH (Remote Radio Head) system with a plurality of antenna ports distributed and arranged respectively in each cell, comprising:

a selecting section configured to select the antenna ports for each user terminal to connect to, from the antenna ports of the cell in which each user terminal is located; and

a power setting section configured to control a transmit power of the antenna ports;

wherein the selecting section and the power setting section are configured to set predetermined conditions for a target SINR (t) of each user terminal and for the transmit power of the antenna ports, to select the antenna ports for each user terminal such that the minimum SINR value of the SINRs of the user terminals in the plurality of cells is maximized, and to control the transmit power of each antenna port,

wherein the selecting section is further configured to set the predetermined conditions respectively for the target SINR (t) of each user terminal, a sum value of the transmit power for the user terminals of each antenna port and a sum value of the transmit power of each antenna port for each user terminal, and to select the antenna ports for each user terminal such that a sum of the transmit power of each cell is respectively minimized, and

wherein the selecting section is further configured to select the antenna port for each user terminal to connect to by exploiting the following equation (2):

$$\min_{\{p_{im}\}} \quad \sum_i \|p_{im}\|_1 \qquad \text{equation (2)}$$

subject to

$$SINR_i = \frac{p_{im}^T g_{im}}{\sum_{l=1}^{L} \sum_{k \neq i} p_{il}^T g_{il} + \sigma_i^2} \geq t, \quad \forall_i \in \{1,...,K\}$$

$$\sum_{i=1}^{K} p_{im} \leq P1, \quad \forall_m \in \{1,...,L\}$$

$$\|p_{im}\| \leq P, \quad \forall_i \in \{1,...,K\},$$

where

p_{im}: a vector which shows the power allocation for the antenna port of the cell m which transfers data to the user terminal i;

g_{im}: channel strength between the cell m and the user terminal i

$\left(\left[|h_{i,(m-1)M+1}|^2, \cdots, |h_{i,mM}|^2\right]^T\right)$;

L: the number of cells per cluster;

K: the number of users per cluster (i = 0~K-1);

σ_i^2 : noise power;

t: target SINR;

P: maximum transmit power; and

P1 : [P, P, P, ...].

2. The base station according to claim 1, wherein said each user terminal comprises one antenna and the selecting section is further configured to allocate one antenna port to each user terminal.

3. The base station according to claim 1, wherein the plurality of cells constitute one cluster and exchange of user data is not carried out among different cells.

4. A base station in a RRH system with a plurality of antenna ports distributed and arranged respectively in each cell, comprising:

a selecting section configured to select the antenna ports for each user terminal to connect to, from the antenna ports of the cell in which each user terminal is located; and

a power setting section configured to control a transmit power of the antenna ports;

wherein the selecting section and the power setting section are configured to set predetermined conditions for a target SINR (t) of each user terminal and for the transmit power of the antenna ports, to select the antenna ports for each user terminal such that the minimum SINR value of the SINRs of the user terminals in the plurality of cells is maximized, and to control the transmit power of each antenna port,

wherein the power setting section is further configured to control the transmit power of each antenna port such that the transmit power of the antenna ports selected for every user terminal is equal to or less than a predetermined value, and

wherein the power setting section is further configured to control the transmit power of the antenna ports by exploiting the following equation (3):

$$\min_{p} \quad \|p\|_1 \qquad \text{equation (3)}$$

subject to

$$SINR_i = \frac{p_i g_i}{\sum_{k \neq i} p_k g_k + \sigma_i^2} \geq t, \quad \forall_i \in \{1,...,K\}$$

$$p \leq P1,$$

where

p: a transmit power vector after selecting antenna;

g: channel strength between the serving antenna port and the user terminal i;

σ_i^2 : noise power;

t: target SINR;

K: the number of users per cluster (i = 0~K-1);

P1 : [P, P, P, ...]; and

P: maximum transmit power.

5. A wireless communication method in a RRH system in which a plurality of antenna ports distributed and arranged respectively in each cell, comprising:

a step of selecting antenna ports for each user terminal to connect to, from the antenna ports of the cell in which each user terminal is located and controlling a transmit power of the antenna ports;

wherein predetermined conditions for a target SINR (t) of each user terminal and for the transmit power of the antenna ports are set, the antenna ports for each user terminal are selected such that the minimum SINR value of the SINRs of the user terminals in the plurality of cells is maximized, and the transmit power of each antenna port is controlled,

wherein the predetermined conditions are set respectively for the target SINR (t) of each user terminal, a sum value of the transmit power for the user terminals of each

antenna port and a sum value of the transmit power of each antenna port for each user terminal, and the antenna ports for each user terminal are further selected such that a sum of the transmit power of each cell is respectively minimized, and

wherein the antenna port for each user terminal to connect to is further selected by exploiting the following equation (2):

$$\min_{\{p_{im}\}} \quad \sum_i \left\| p_{im} \right\|_1 \qquad \text{equation (2)}$$

subject to

$$SINR_i = \frac{p_{im}^T g_{im}}{\sum_{l=1}^{L} \sum_{k \neq i} p_{il}^T g_{il} + \sigma_i^2} \geq t, \quad \forall_i \in \{1,...,K\}$$

$$\sum_{i=1}^{K} p_{im} \leq P1, \quad \forall_m \in \{1,...,L\}$$

$$\left\| p_{im} \right\| \leq P, \quad \forall_i \in \{1,...,K\}$$

where

p_{im}: a vector which shows the power allocation for the antenna port of the cell m which transfers data to the user terminal i;

g_{im}: channel strength between the cell m and the user terminal i

$\left(\left[\left| h_{i,(m-1)M+1} \right|^2, \cdots, \left| h_{i,mM} \right|^2 \right]^T \right)$;

L: the number of cells per cluster;

K: the number of users per cluster (i = 0~K-1);

σ_i^2 : noise power;

t: target SINR;

P: maximum transmit power;

P1 : [P, P, P, …].