

1
1 2 ;
1 2 ;
1 2
;
2
1 , 1 2
2 1
3
1 , 1 2
.
4
3 ,
1 , ,
2 2 ,
,
5
1 ,
.

[0001] Division Multiplexing : OFDM) (Orthogonal Frequency ad-hoc

[0002] (Multi-Input Mutil-output :

MIMO system) .

[0003]

[0004]

1 2 ; 1 2
; 1 2
;

[0005]

[0006]

[0007]

1 2
3
4 , 6
5 , 8
7 8 20 dB , 9
7 8 10^{-5}

[0008]

1 1 (110)
(120),
(130)

[0009] 2 3

(I, I)

I) .

,

12 (S210).

[0010] 1 2
 , (I,II) . 1
 (Time t) , ,
 (Time t+T) , , 2
 (Time t) 2 , ,
 (Time t+T) , (S220).

$$\begin{aligned}
& \left(\begin{array}{ccc} 3 & 1 & 2 \\ & & \end{array} \right. \\
& \left. \begin{array}{ccc} & & \\ & & \end{array} \right) C_{1,\delta_0}, \\
& \left(\begin{array}{ccc} 2 & & \\ & & \end{array} \right) C_{2,\delta_0}, \\
& \left(\begin{array}{ccc} 2 & & \\ & & \end{array} \right) C_{1,\delta_1} C_{1,\delta_2}, \\
& \left(\begin{array}{ccc} 2 & & \\ & & \end{array} \right) C_{2,\delta_1} C_{1,\delta_2} \quad (S230).
\end{aligned}$$
$$Y_{R_i} = C_j G_i + N_j, \quad j=1,2, \quad i=1,2,3$$

[0014] G (Circular symmetric) N (AWGN) $N_0/2$

$$\begin{pmatrix} C_1 & C_2 \\ -C_2^* & C_1^* \end{pmatrix}$$

[0016]

$$\hat{C}_j = \frac{Y_{R_i}}{G_i}, \quad j=1,2, \quad i=1,2,3$$
$$\hat{C}_j \quad \mathbf{i}$$

$$[0031] \quad L \quad , \quad \frac{1}{\sqrt{L}}$$

(normalization)

, e

$$7 \quad C_2, \quad C_1^*$$

8

$$[0032] \quad H_{23} = \frac{1}{\sqrt{2}} (H_2 + H_3 \cdot e^{j2\pi k \delta_i / K}$$

$$[0033] \quad 5 \quad .$$

9

$$[0034] \quad Y_D(t) = C_1 H_1 + C_2 H_{23} + N(t)$$

$$[0035] \quad Y_D(t+T) = -C_2^* H_1 + C_1^* H_{23} + N(t+T)$$

$$[0036] \quad .$$

10

$$[0037] \quad \widehat{C}_1 = Y_D(t) H_1^* + Y_D^*(t+T) H_{23}$$

$$[0038] \quad \widehat{C}_2 = Y_D H_{23}^* - Y_D^*(t+T) H_1$$

$$[0039] \quad .$$

11

$$[0040] \quad \widehat{C}_1 = (\alpha_1^2 + \alpha_{23}^2) C_1 + N(t) H_1^* + N^*(t+T) H_{23}$$

$$[0041] \quad \widehat{C}_2 = (\alpha_1^2 + \alpha_{23}^2) C_2 + N(t) H_{23}^* - N^*(t+T) H_1$$

$$[0042] \quad 11 \quad (\quad 3 \quad),$$

$$[0043] \quad 2 \quad . \quad 2 \quad 2$$

$\mathcal{W}, \quad \mathcal{R}$

12

$W, \ R=\frac{I}{2} \ , \ I=even$

$W=\frac{I-1}{2} \ and \ R=\frac{I+1}{2} \ , \ I=odd$

I

δ

13

13

$\delta_w=\frac{K}{W}+\delta_{w-1}$

$\delta_r=\frac{K}{R}+\delta_{r-1}$

$\delta_o \qquad \qquad \qquad C_{1,\delta_0}=C_1$

FFT

(Fast fourier transform) 512 ,
256 .

14

$\begin{pmatrix} C_1 & C_{1,256} & C_2 & C_{2,256}^* \\ C_1^* & C_{1,256}^* & -C_2^* & -C_{2,256}^* \end{pmatrix}$

(correlation)

(zero) .

,

4

4

(

)

SISO (Single-input Single-ouput) MISO (Multi-input

Single-output)

4

5

9

5

8

,

-

[0055] 9 , , FFT 256 , 64
1/3 12
, 8 4 (QPSK)
(DF)
4 ,
1/4
, 1/2 0.4 dB

[0056] 6 ,
 SNR_{SR} SNR_{SR}
 SNR_{SR}
MISO
 SNR_{SR} 20 dB
6

[0057] 7 8 SNR_{SR} 20 dB
4/9 (punctured)
(punctured) 2 , 5, 6 1/2
3, 4

[0058] 9 7 8 10^{-5}
8
2 , 2.5 dB

[0059] ROM, RAM, CD-ROM,
()

[0060] ,

[0061] 1 .

[0062] 2 .

[0063] 3 ,

[0064] 4 ,

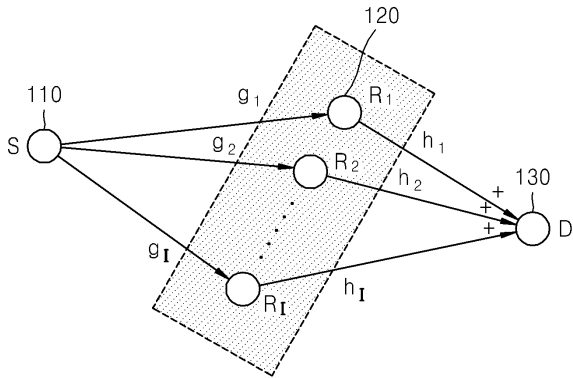
[0065] 5 ,

[0066] 6 ,

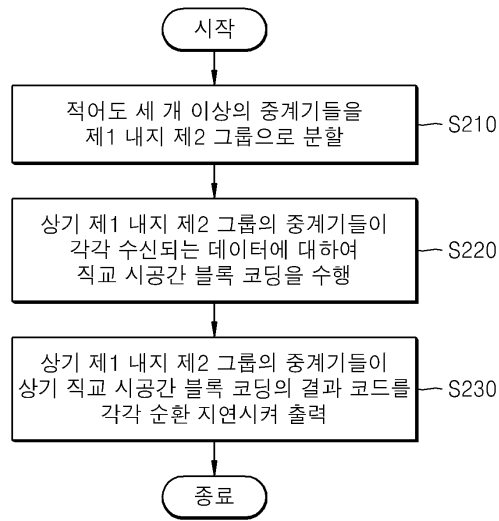
[0067] 7 8 20 dB ,

[0068] 9 76 8 ,

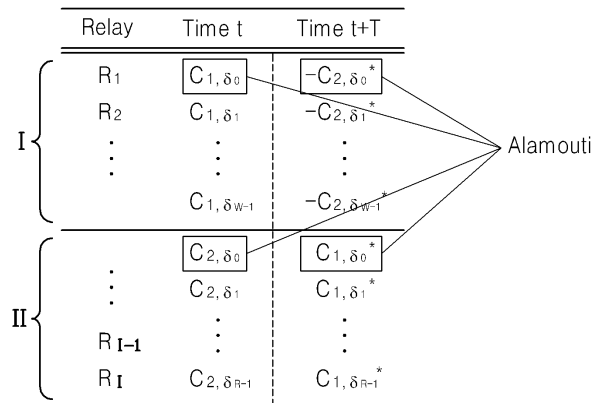
1



2



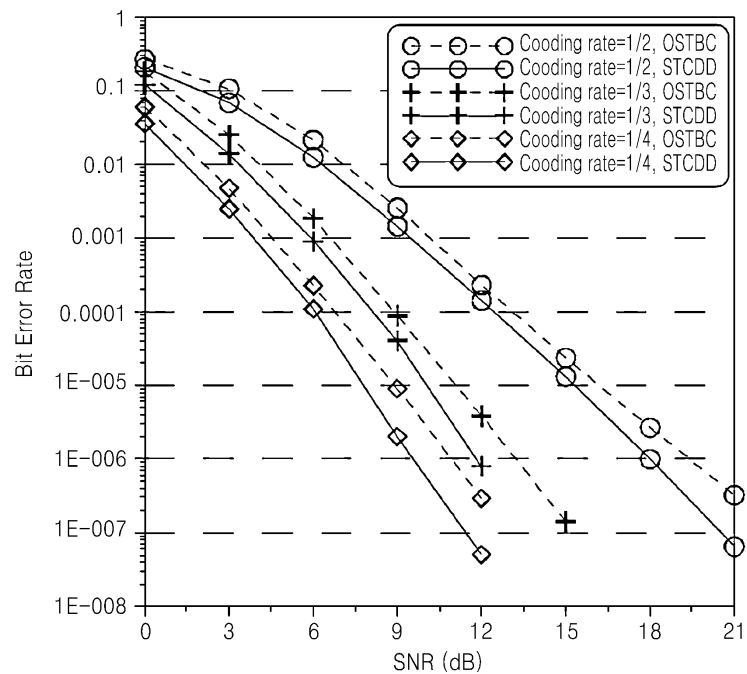
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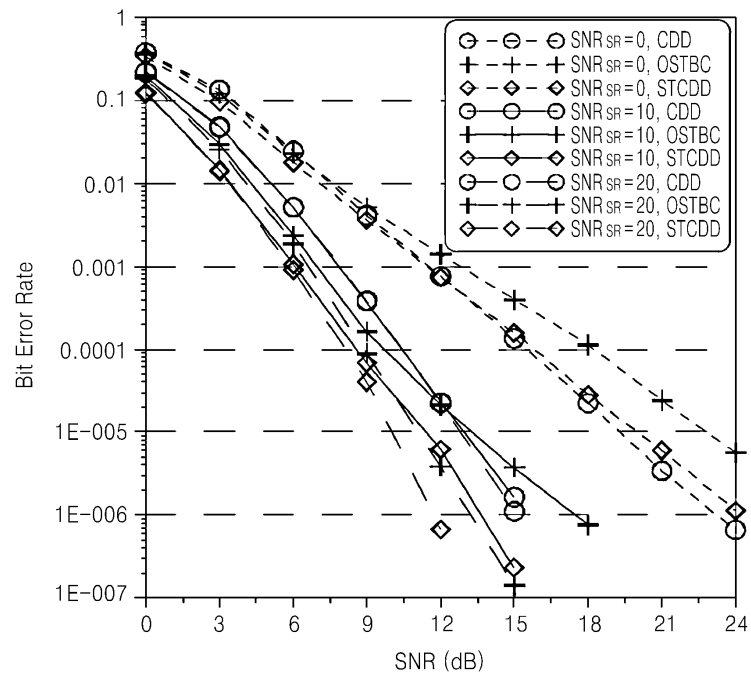
4

중계기 개수	협동 기술	전체 전송률	채널 추정	요구되는 준 정적 (Quasi stationary 시간)
2	순환지연 다이버시티	1/2	SISO	1
	직교 시공간 블록 부호, 시공간 순환지연 다이버시티	1/2	MISO	2
3, 4	순환지연 다이버시티	1/2	SISO	1
	직교 시공간 블록 부호	3/7, 1/3	MISO	4
	시공간 순환지연 다이버시티	1/2	MISO	2
5	순환지연 다이버시티	1/2	SISO	1
	직교 시공간 블록 부호	2/5	MISO	15
	시공간 순환지연 다이버시티	1/2	MISO	2
6	순환지연 다이버시티	1/2	SISO	1
	직교 시공간 블록 부호	2/5	MISO	30
	시공간 순환지연 다이버시티	1/2	MISO	2

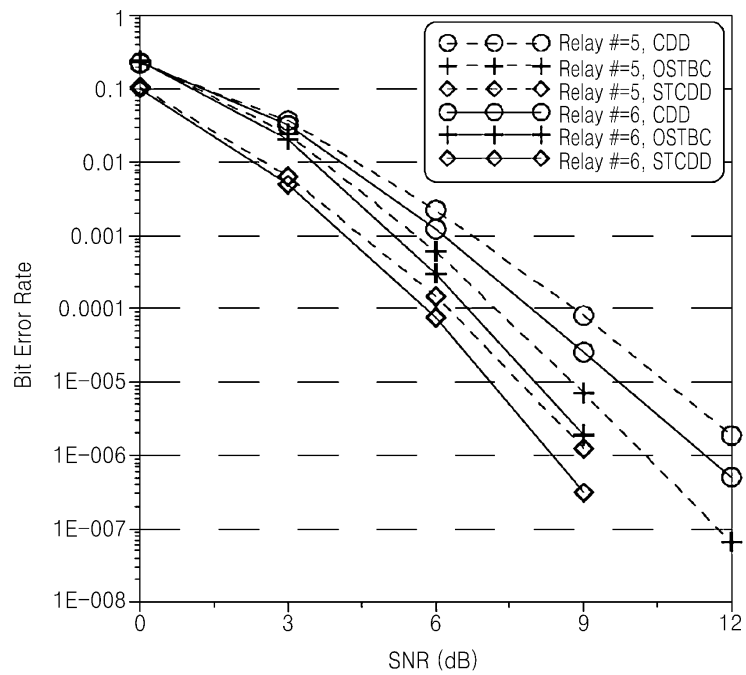
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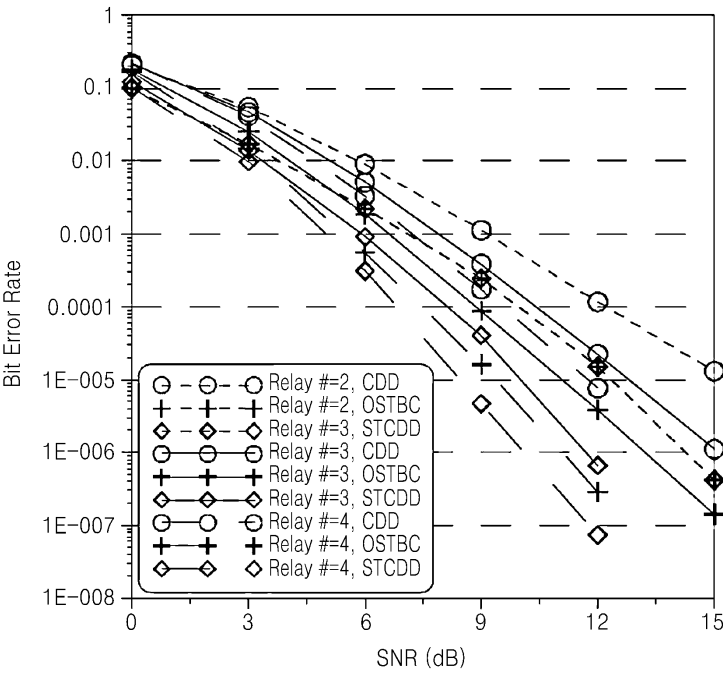
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7



8



9

