

6.7.2

- (a) see plots
- (b) see plots
- (c) to match to B_c

$Q = \text{same}$

$$P = \int_{u_d}^{u_d} v(u) (v(u)^H \mathbf{1}/N) du$$

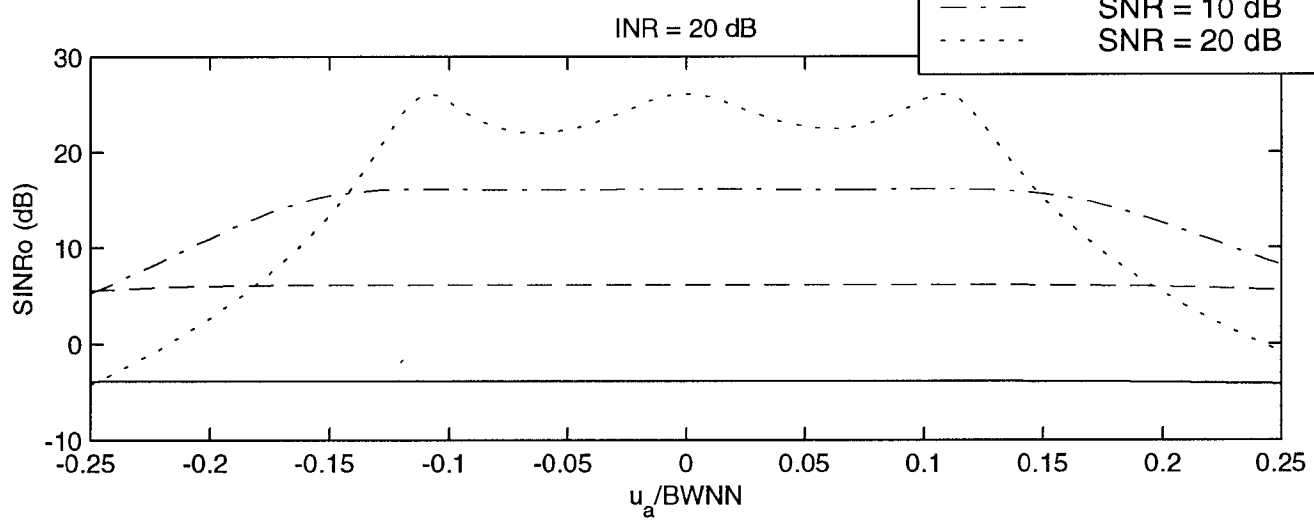
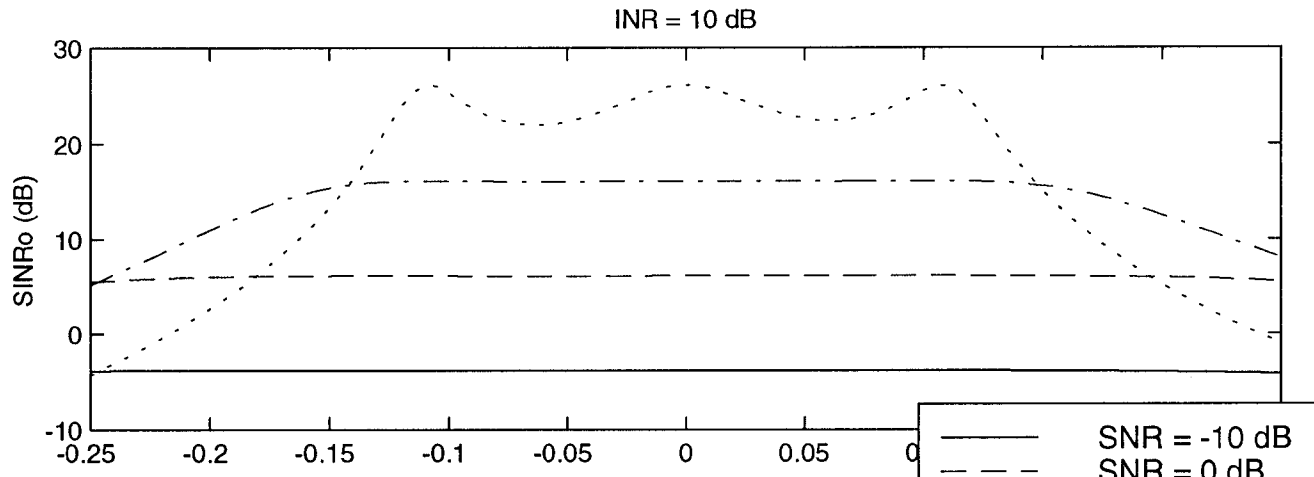
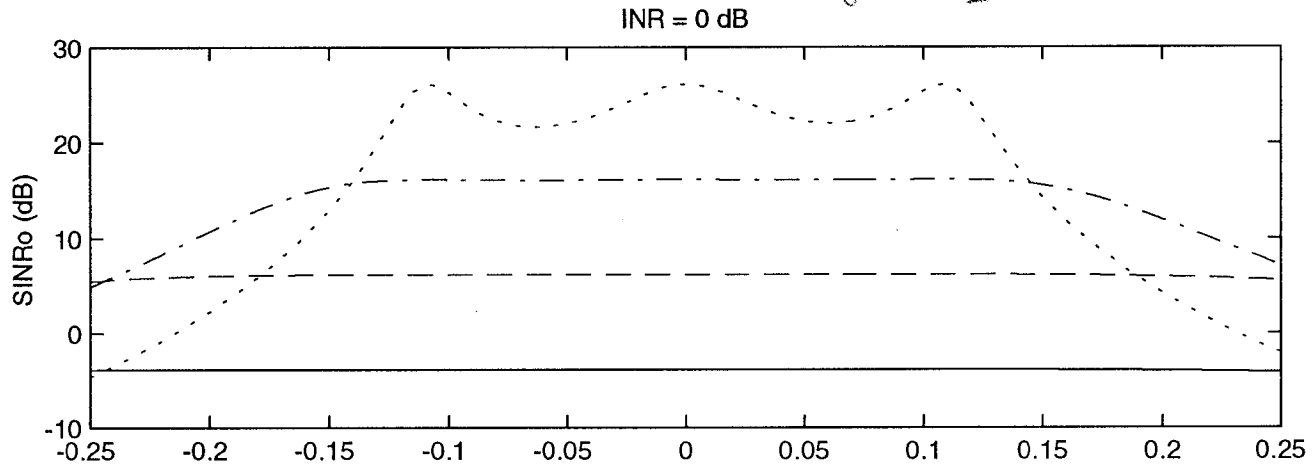
$$P = Q \cdot \mathbf{1}/N$$

- all behave robustly for $\text{SNR} = -10, 0 \text{ dB}$
- different types of degradation for $\text{SNR} = 10, 20 \text{ dB}$
- eigenvector similar to directional
- INR does not have much effect - in ~~the~~ sidelobe

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Directional Constraints $u = -0.0733 \ 0 \ 0.0733$

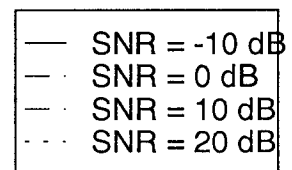
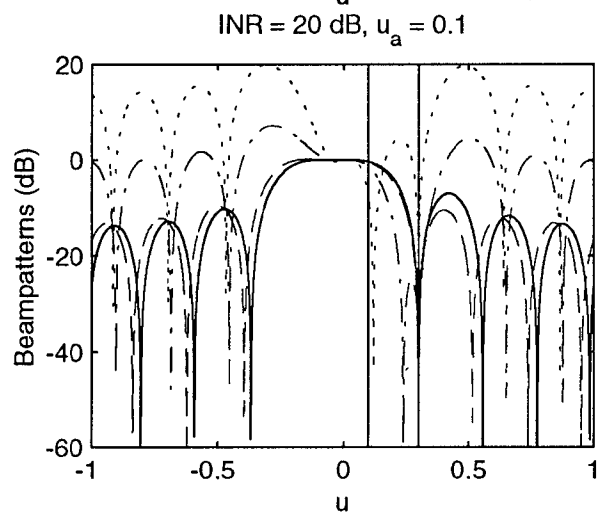
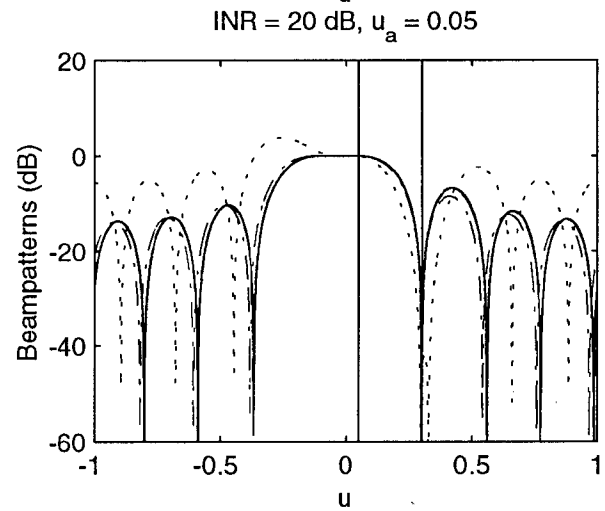
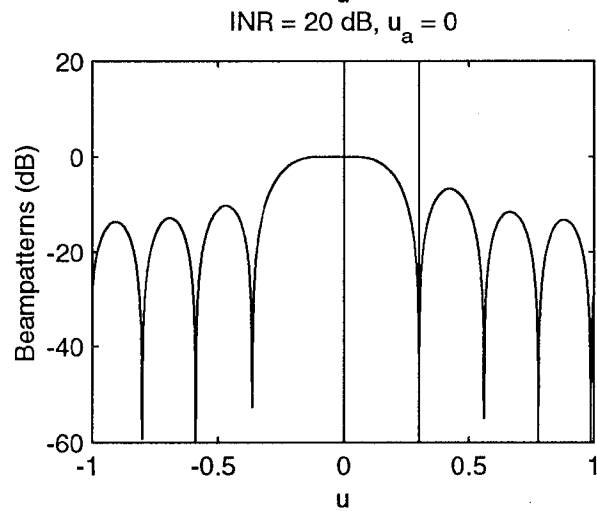
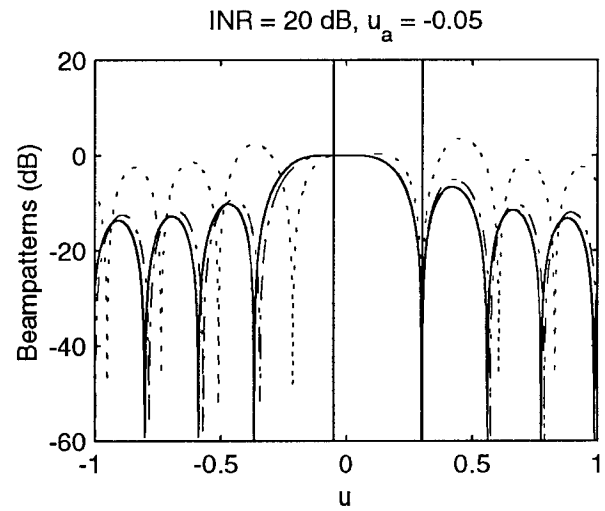
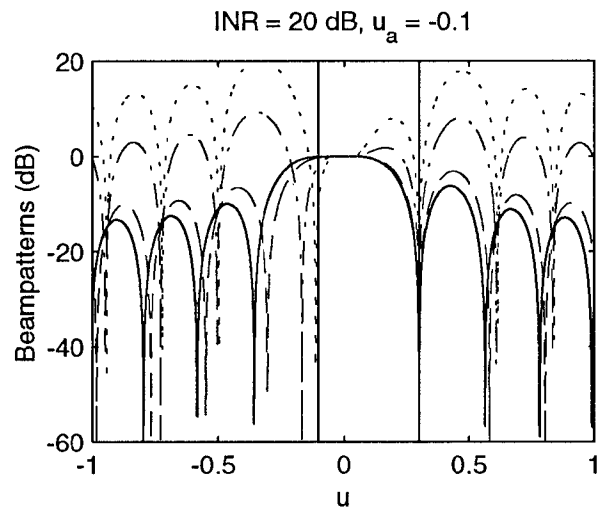
$\theta = []$



Directional Constraints

-0.0433, 0, 0.0433

$$g = \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix}$$

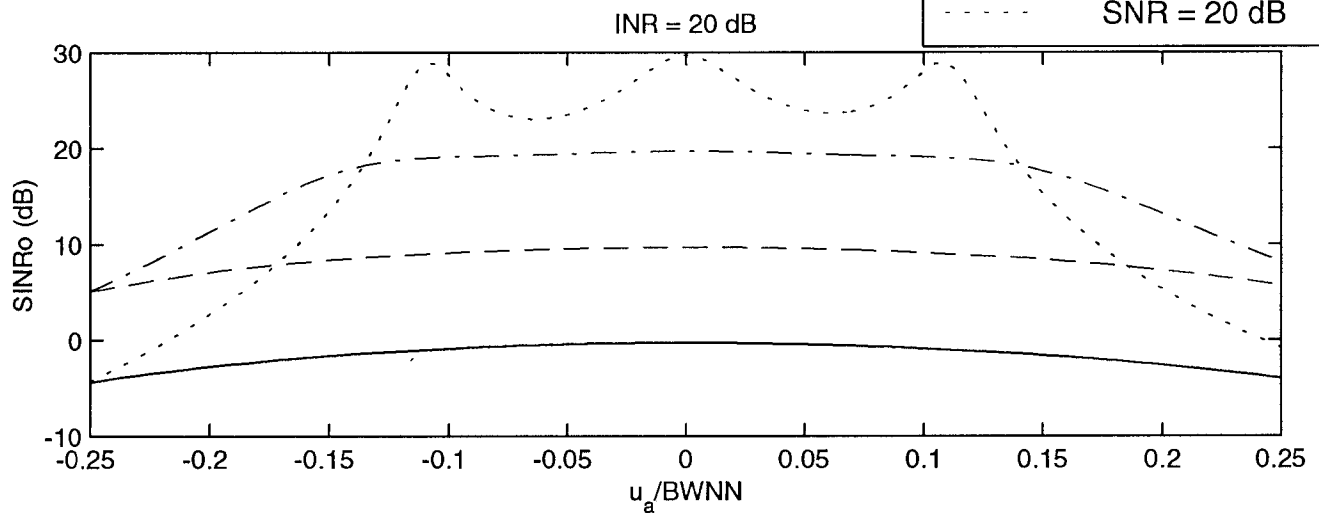
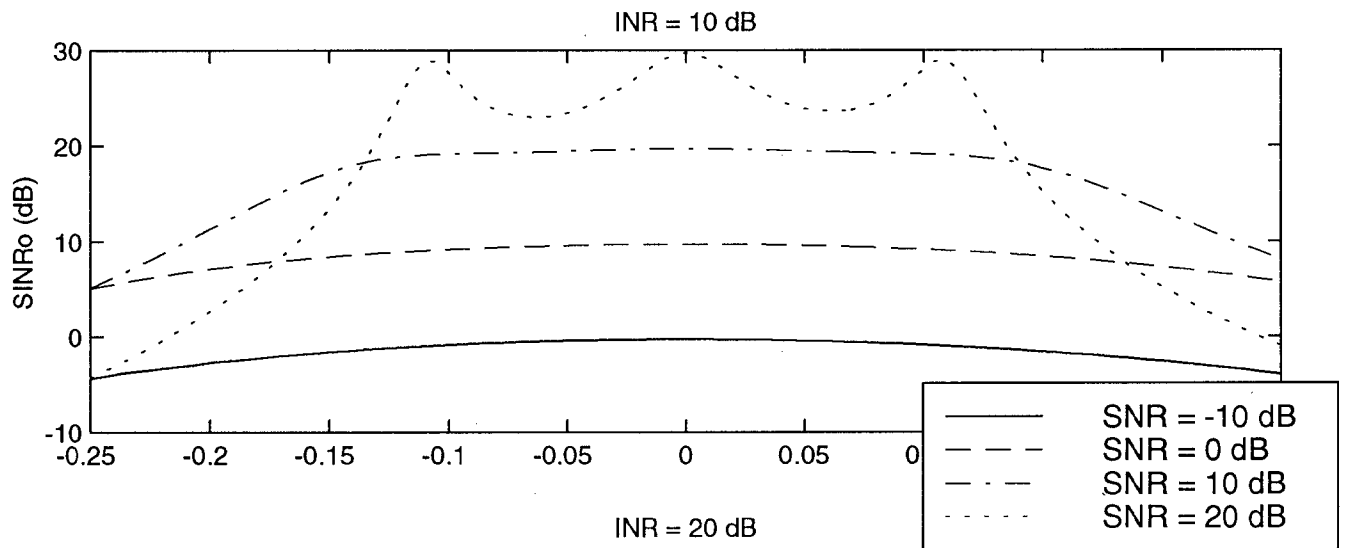
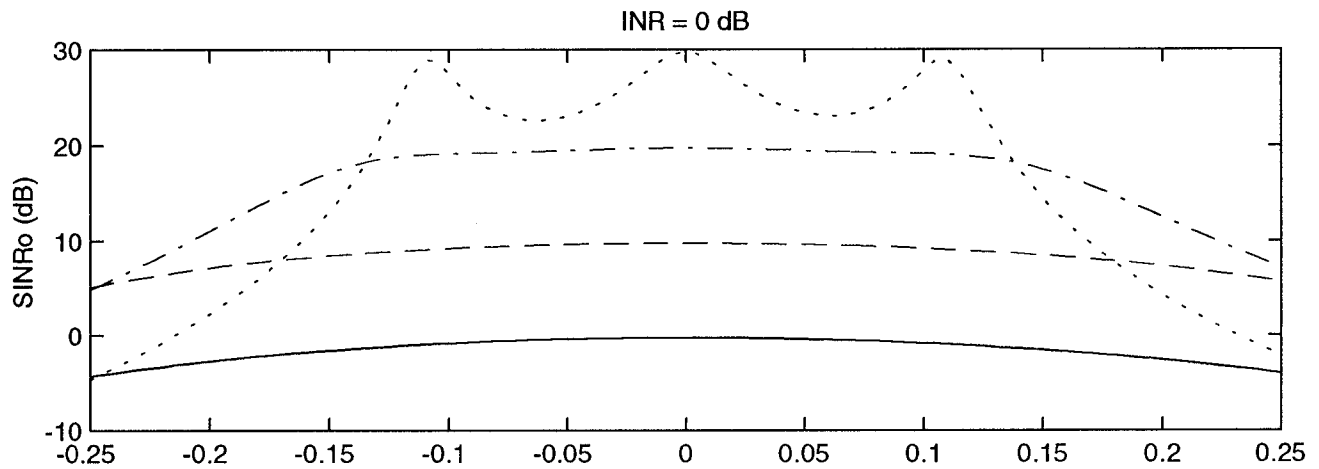


Directional

$u = -0.0433, 0, 0.0433$

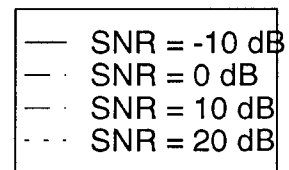
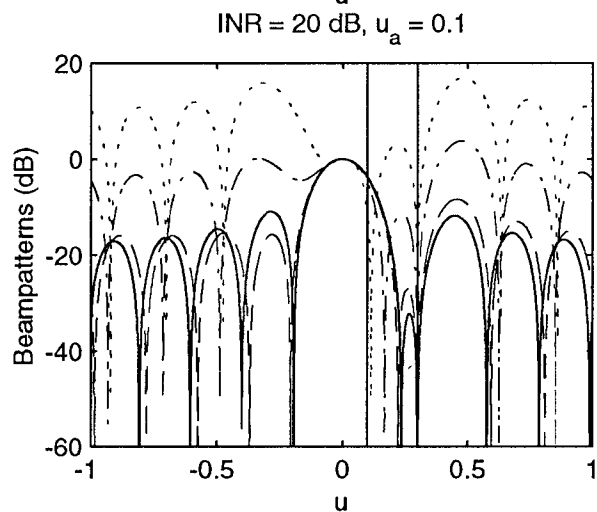
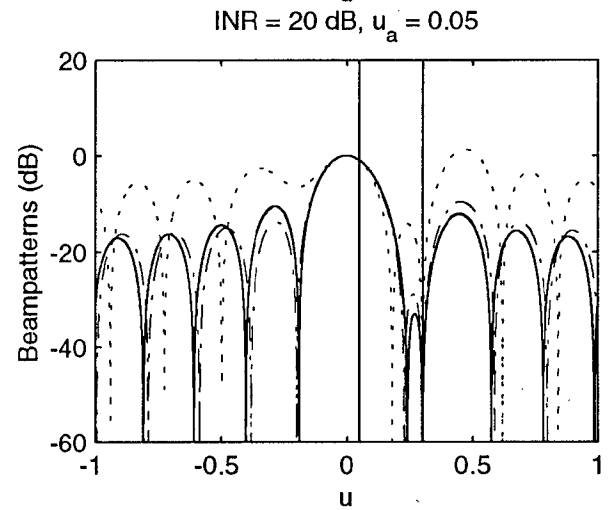
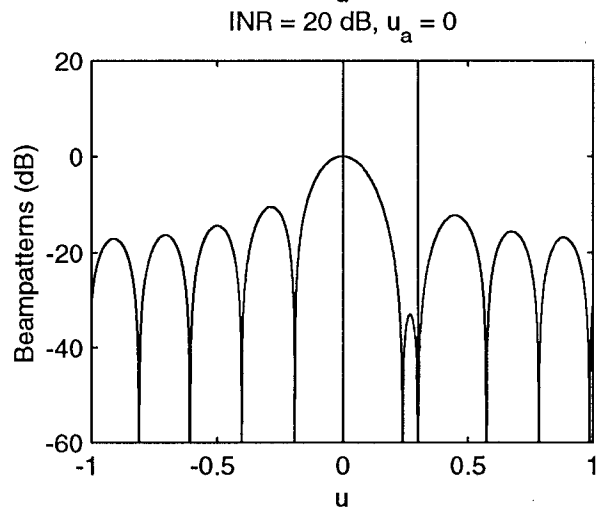
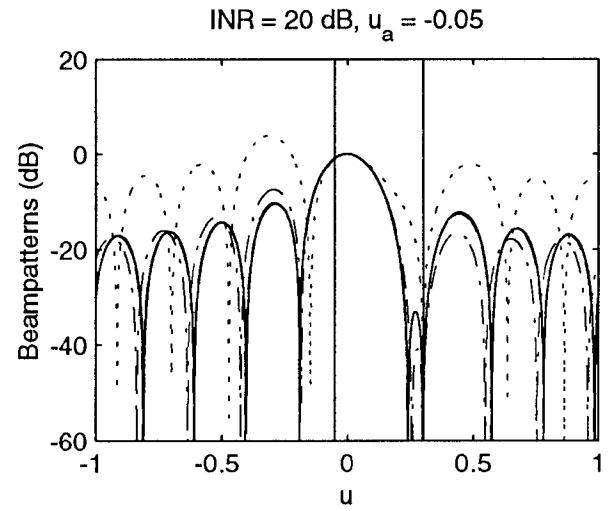
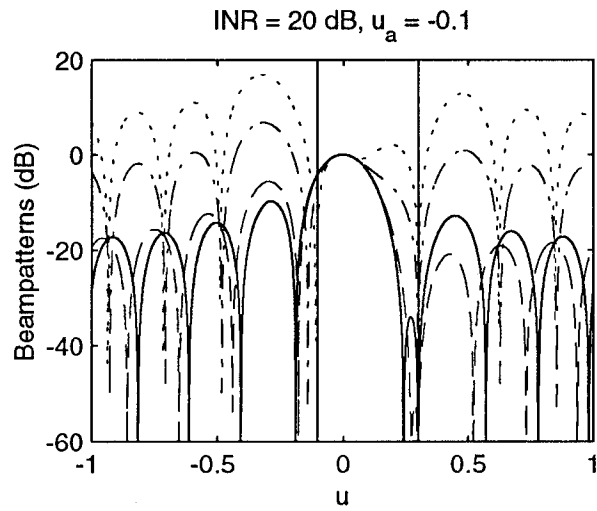
7 matches B_c

6.7.2 4/28



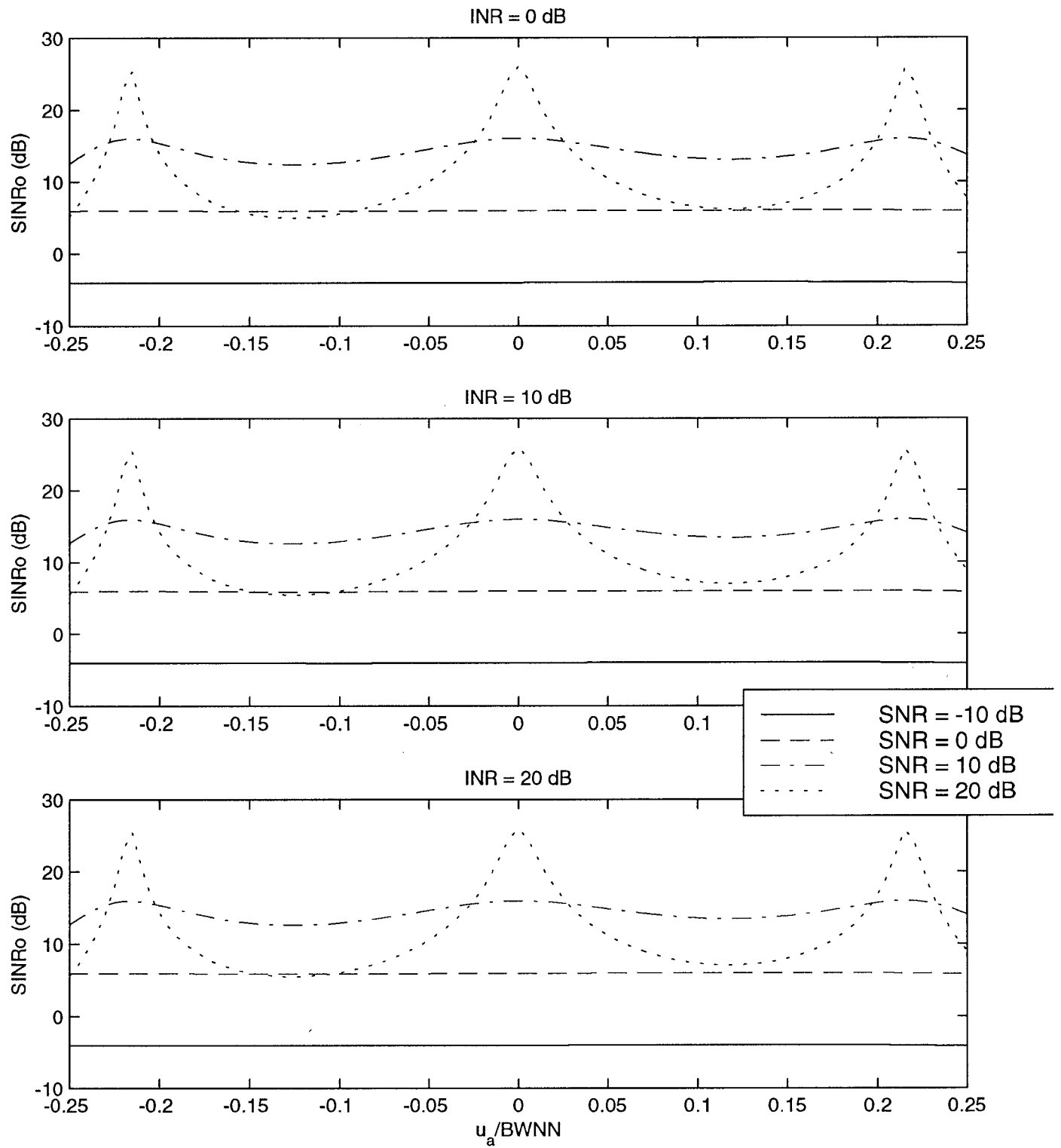
Directional $u_c = [-0.0933 \ 0 \ 0.0933]$
 q matches B_c

6.7.2 5/28



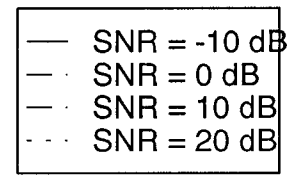
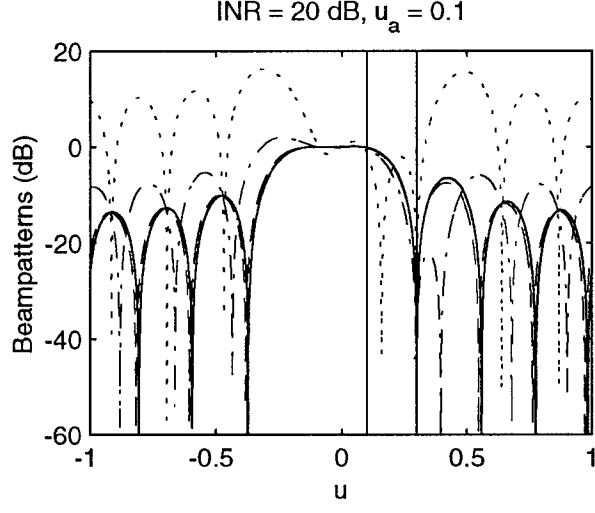
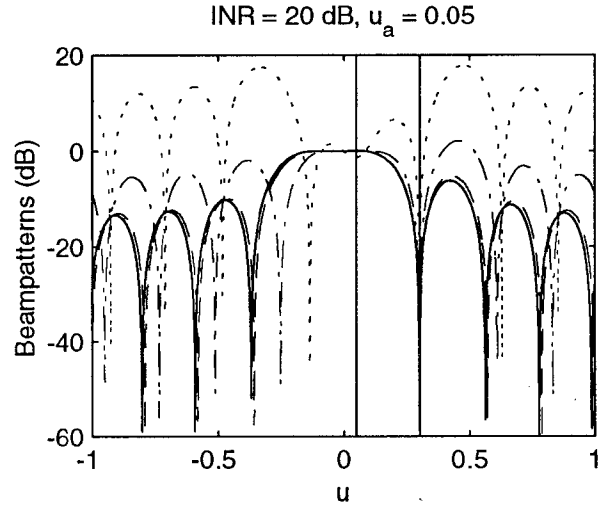
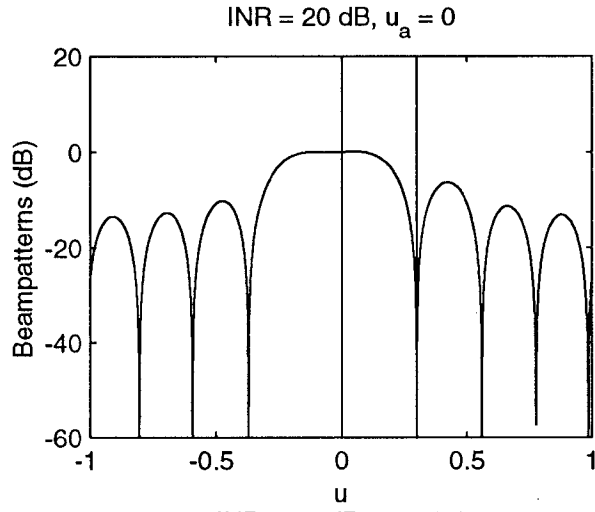
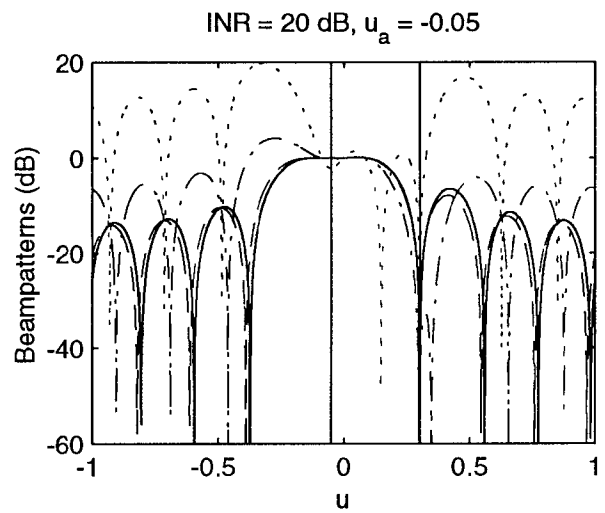
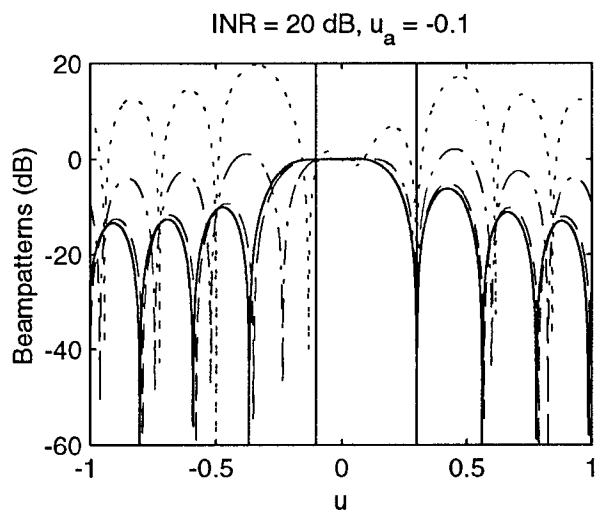
6.7.2 6/28

Directional Constraints $u_c = [0.0866 \ 0 \ 0.0866]$ $g = \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix}$

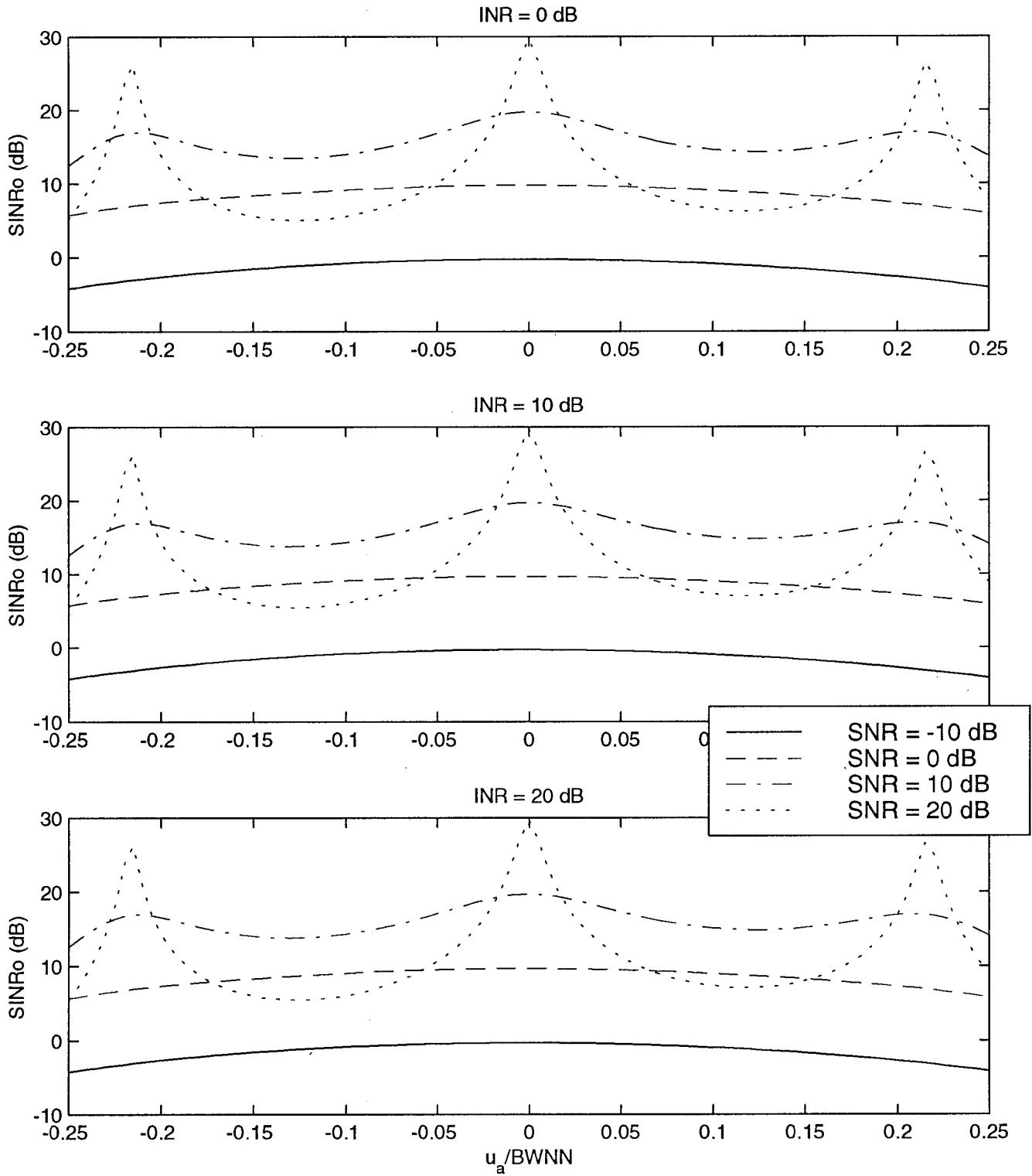


6.7.2 7/28

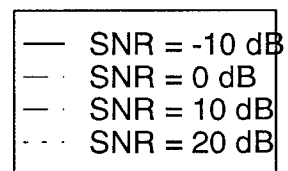
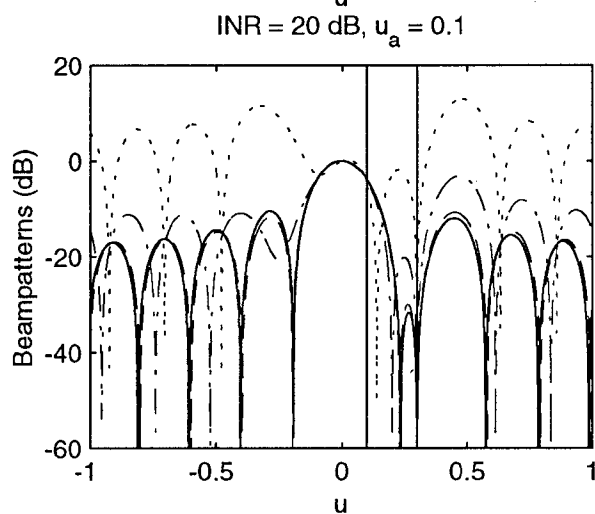
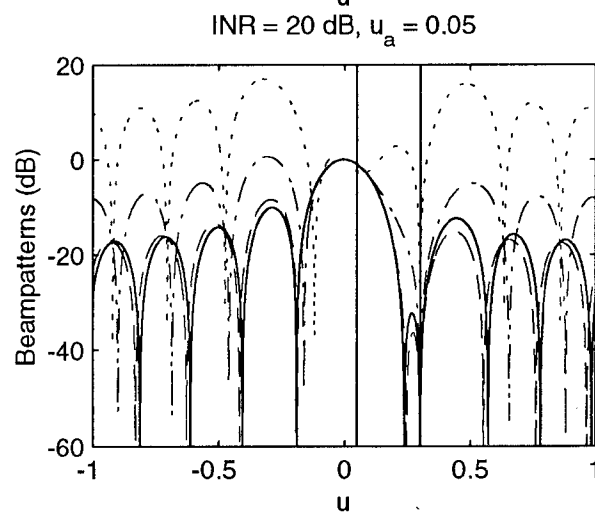
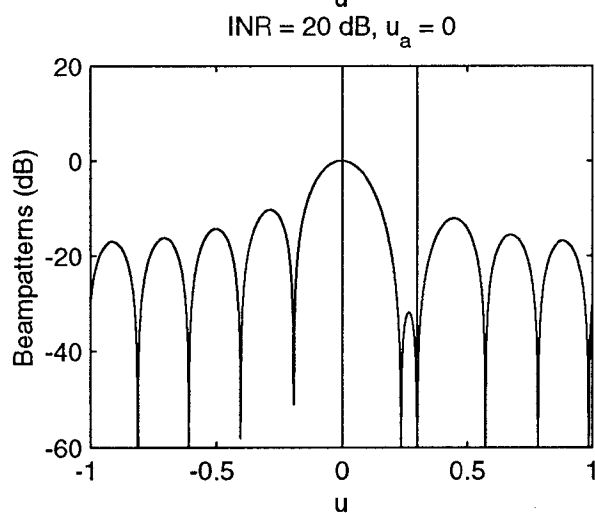
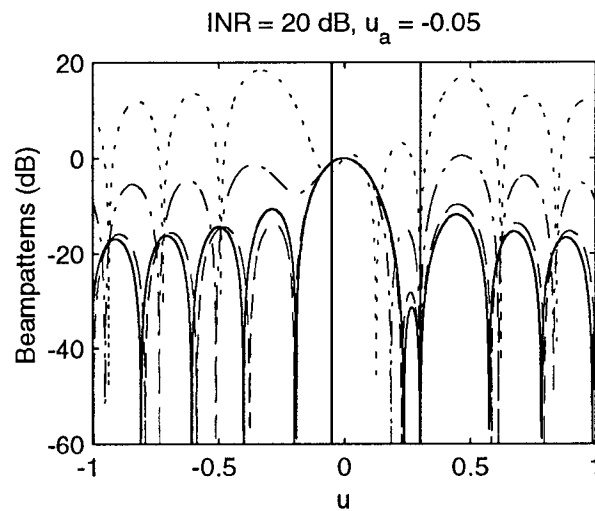
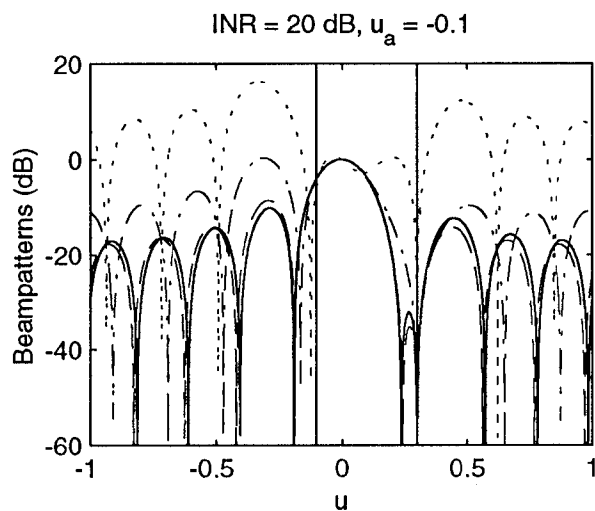
Directional constraints $u_c = [-0.0866 \ 0 \ 0.0866] q^T$



Directional $u_c = -0.0846, 0, 0.0846$
g matches B_c



Directional $u = -0.0844, 0, 0.0866$
 q matches B_c

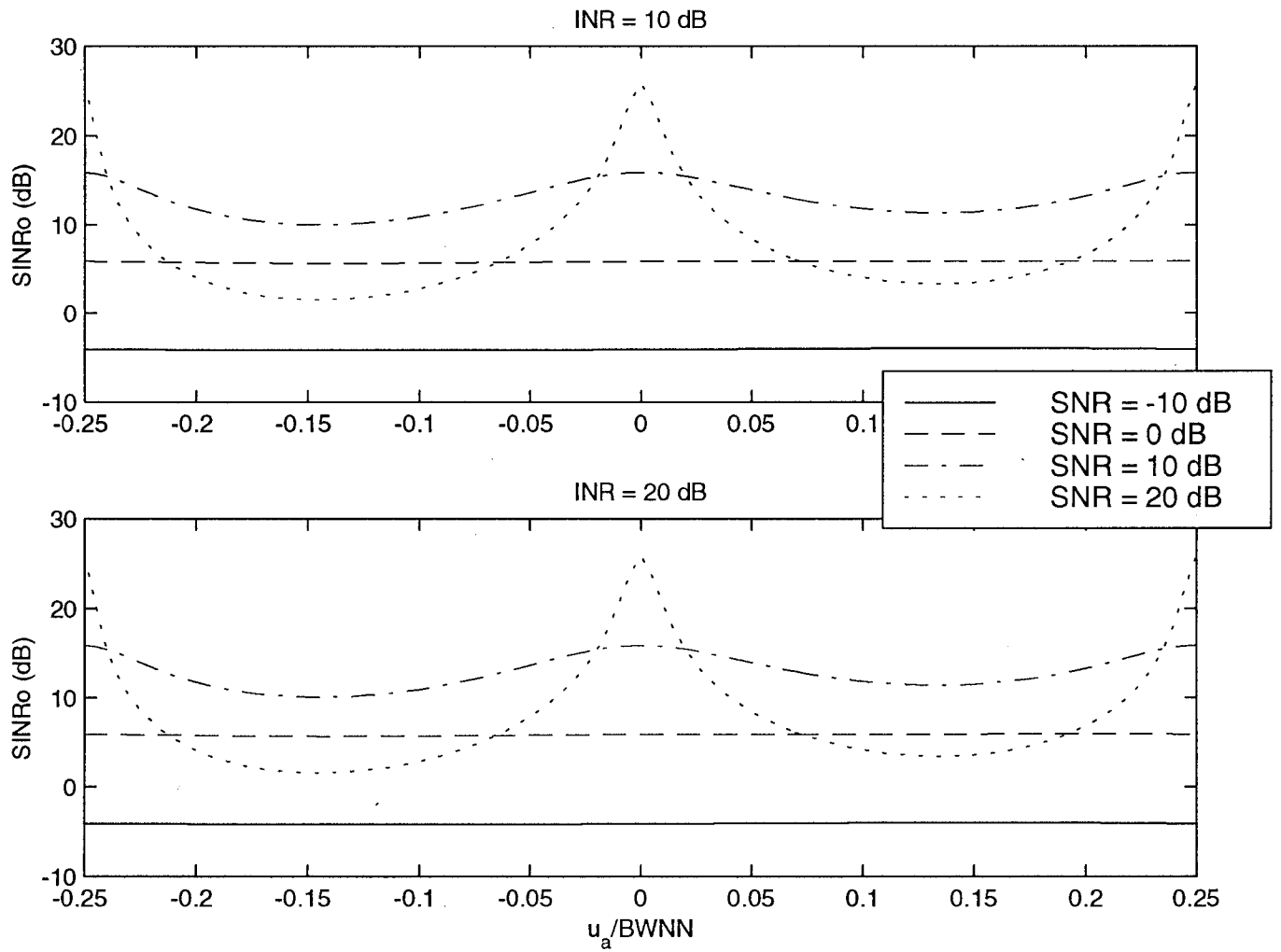
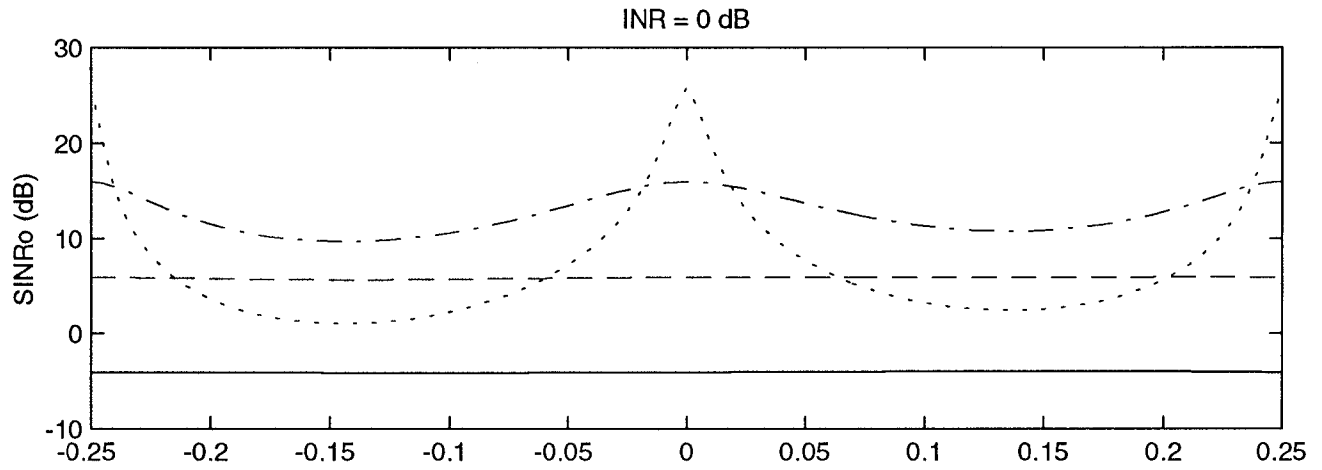


Directional Constraints

$$u = [-0.1 \ 0 \ 0.1]$$

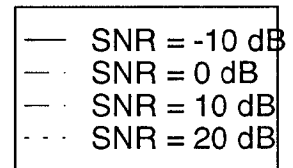
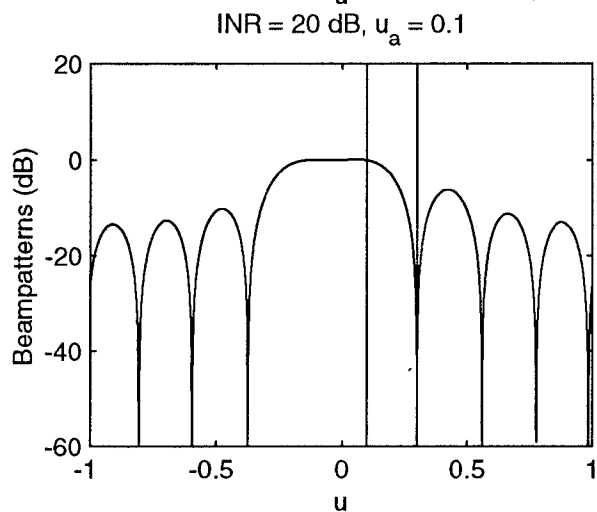
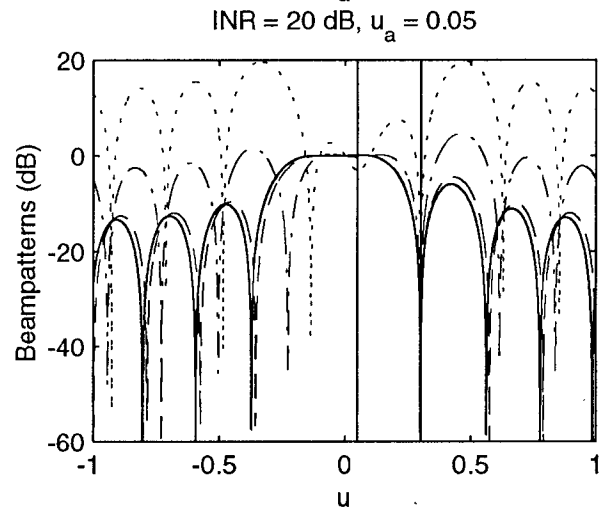
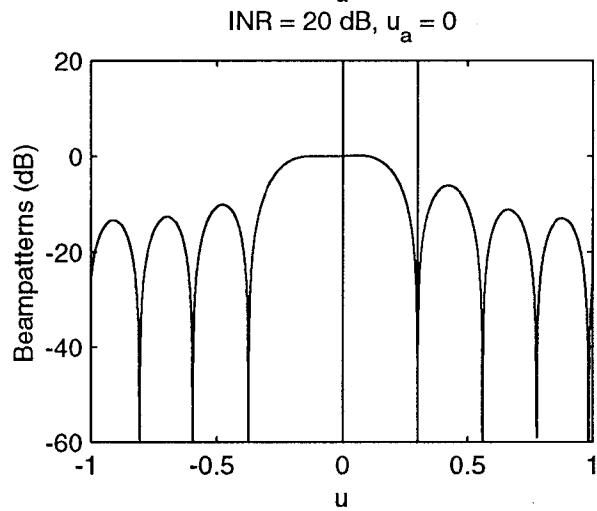
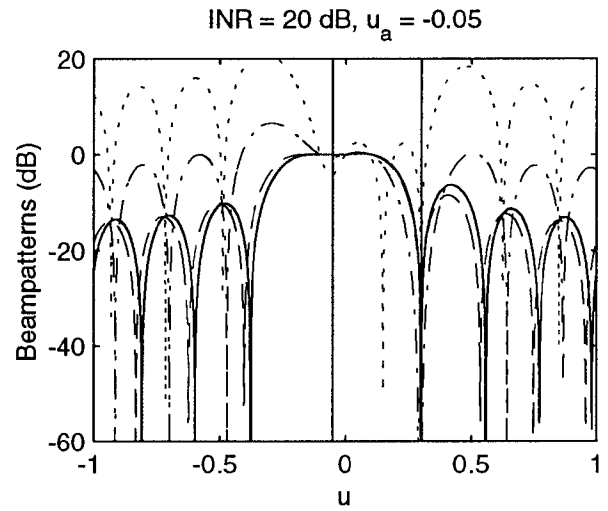
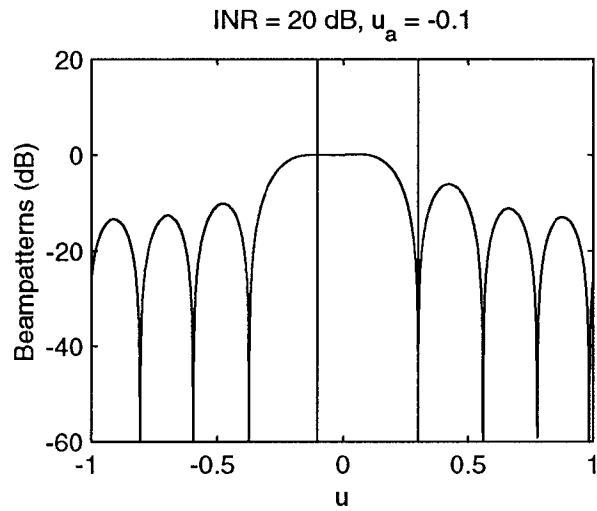
$$g = \begin{bmatrix} 1 \\ 1 \end{bmatrix}$$

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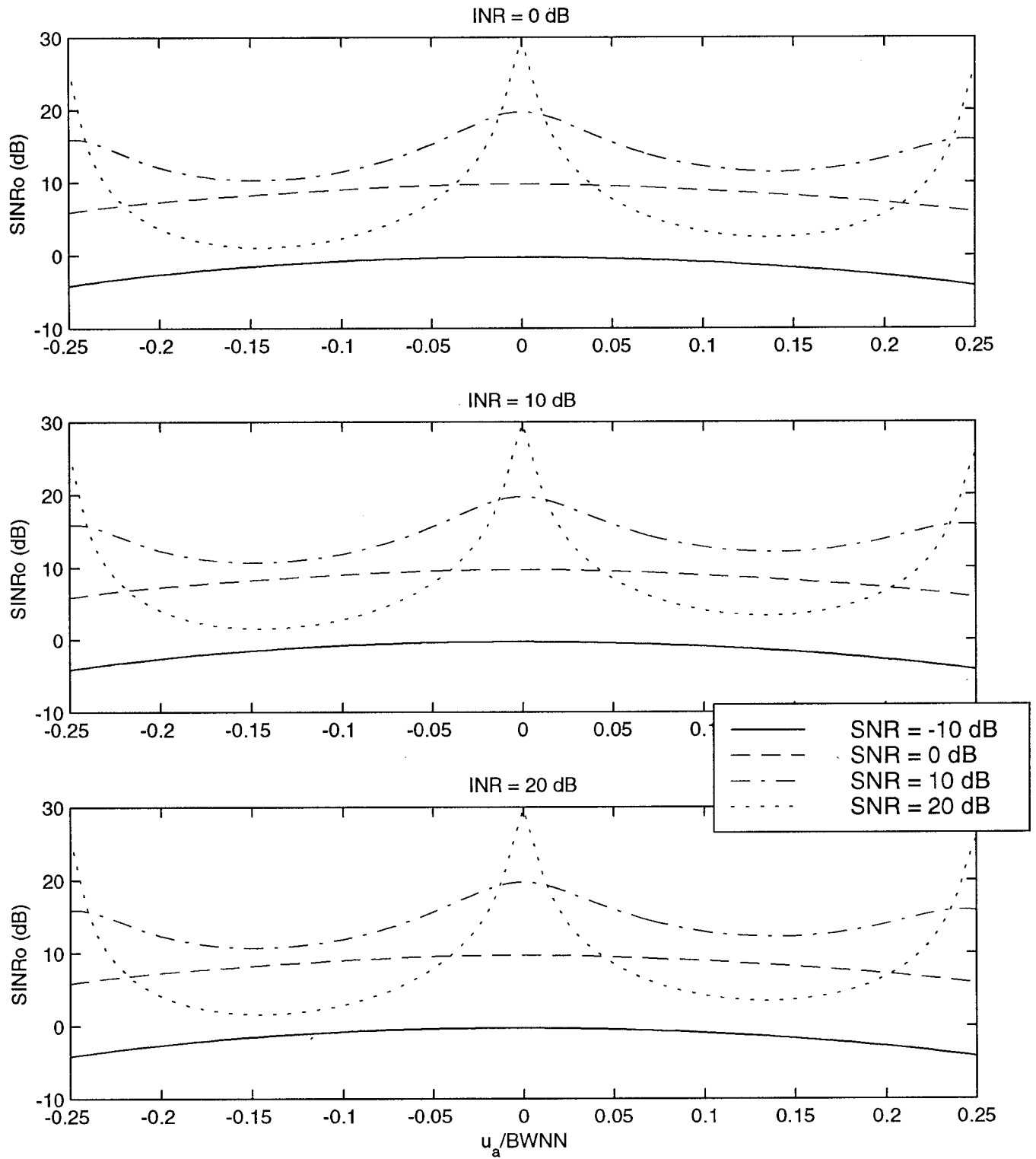
6.7.2 11/28

Directional $u_c = [-0.1, 0, 0.1]$ $g = \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix}$

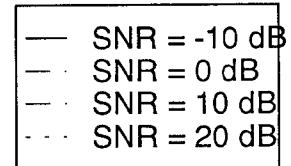
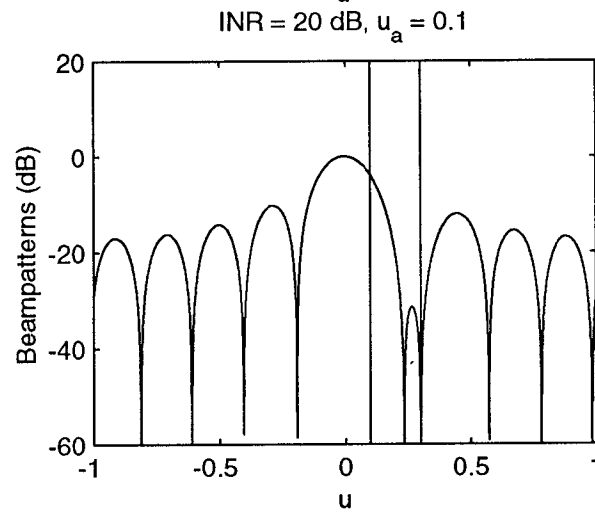
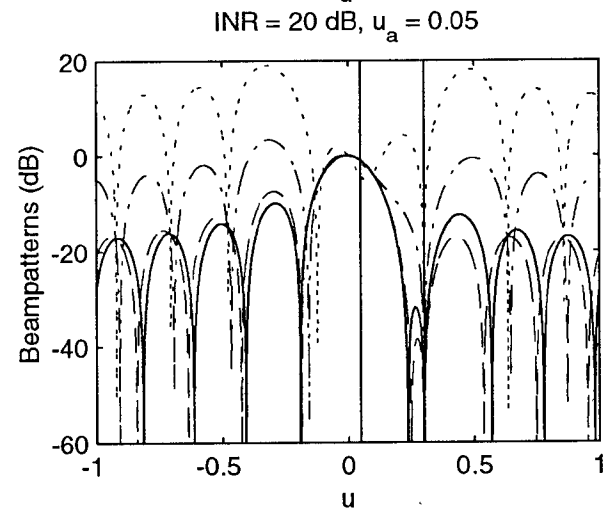
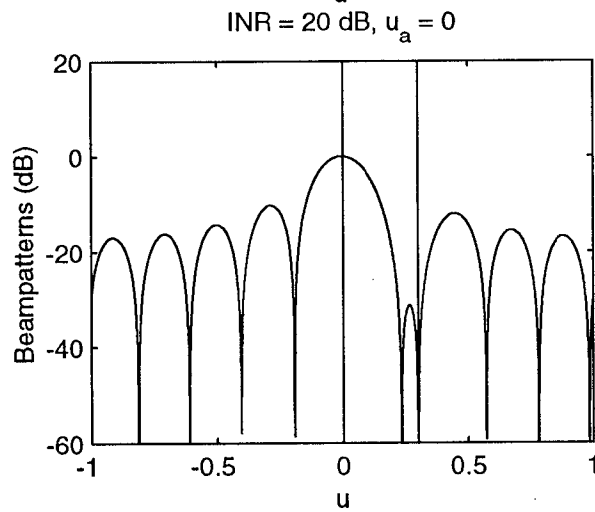
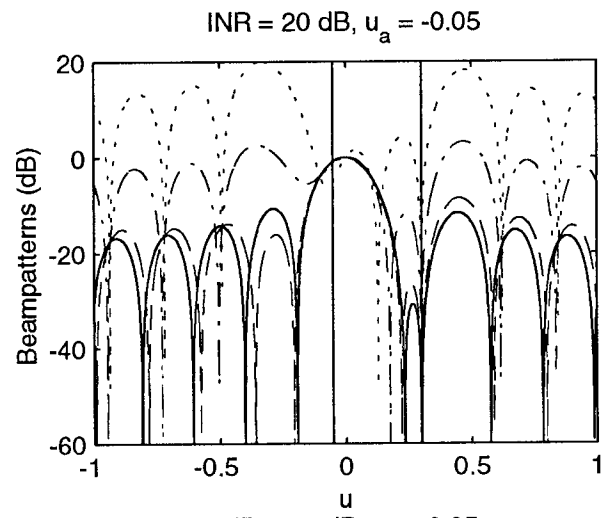
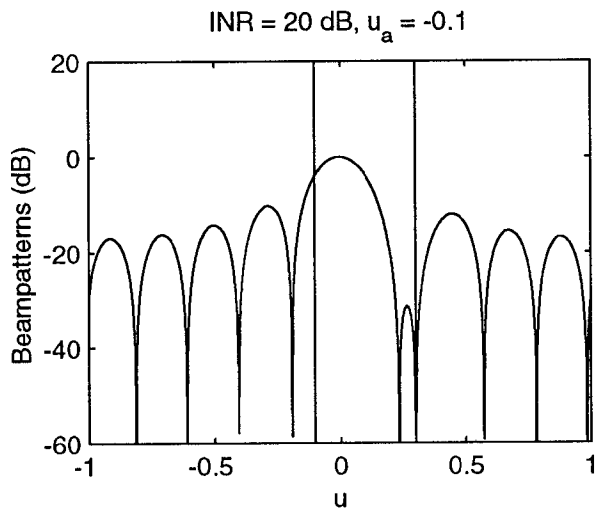


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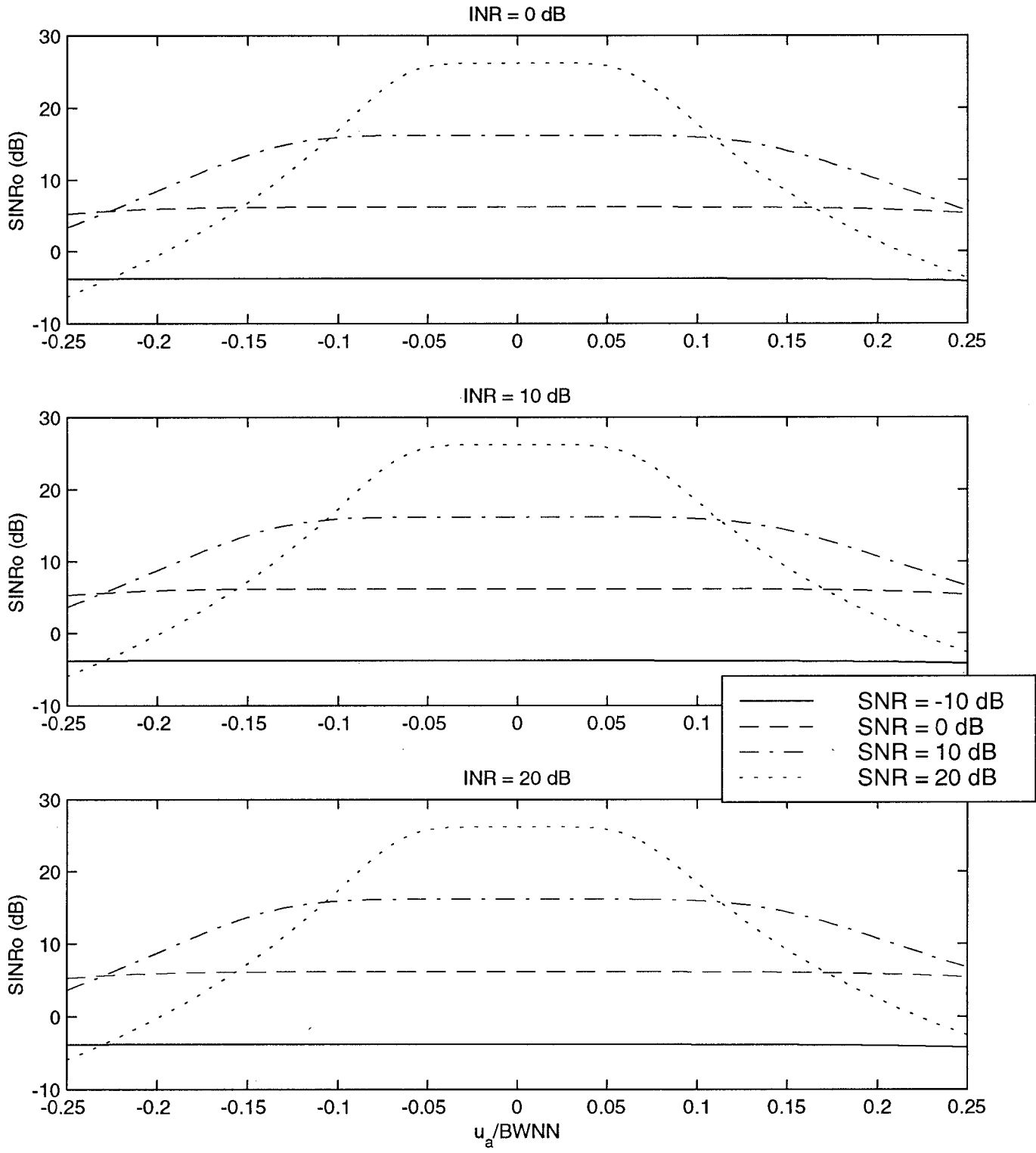
Directional $u = 0.1, 0, 0.1$ g matches \mathbb{B}_c



Directional $u = -0.1, 0, 0.1$ g matches E_c

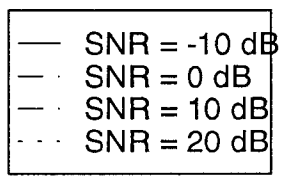
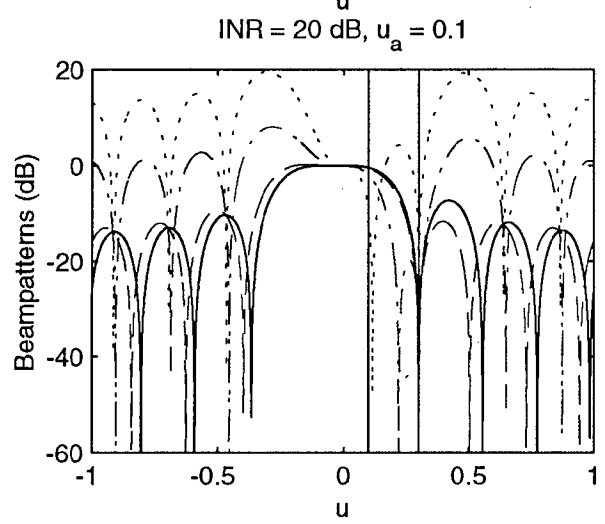
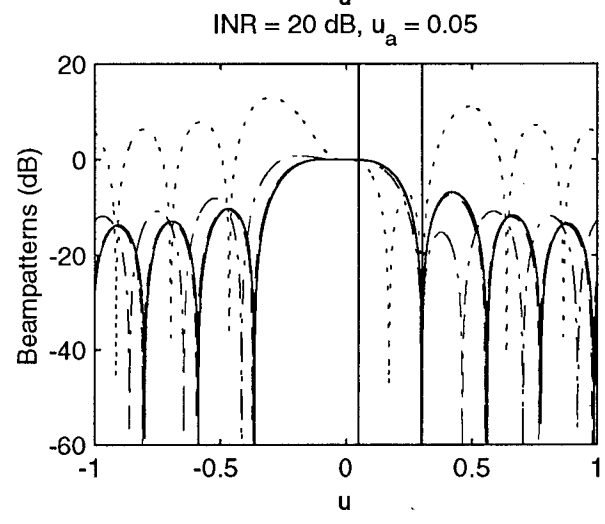
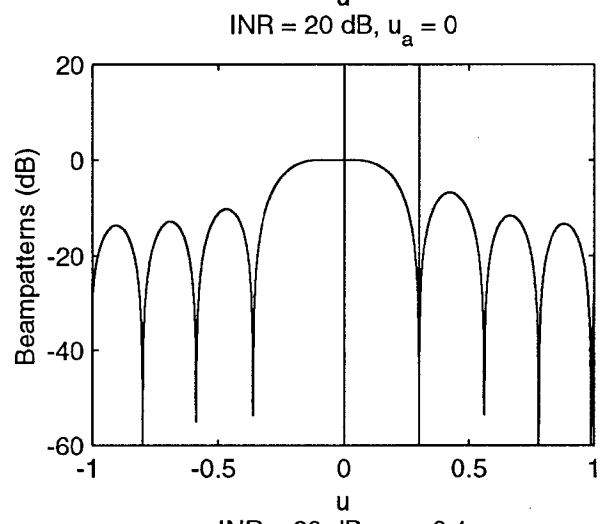
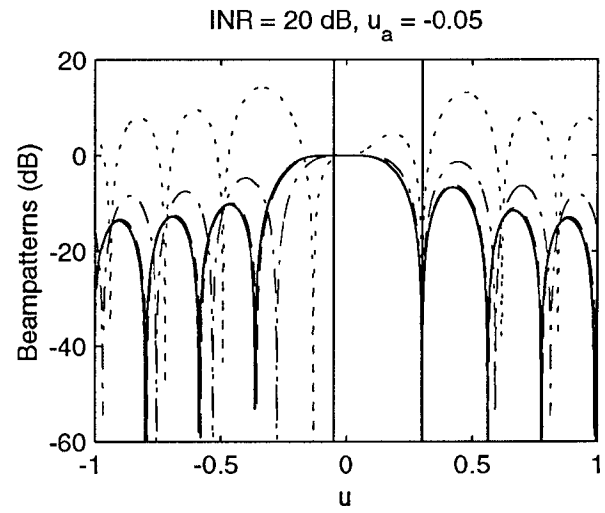
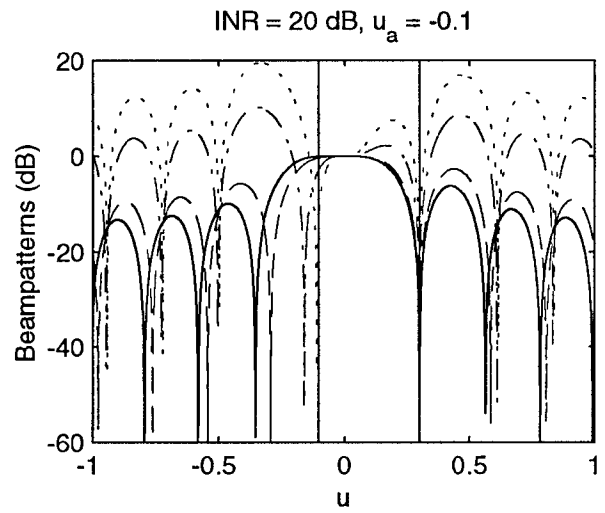


Derivative, $g = \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}$



Derivative

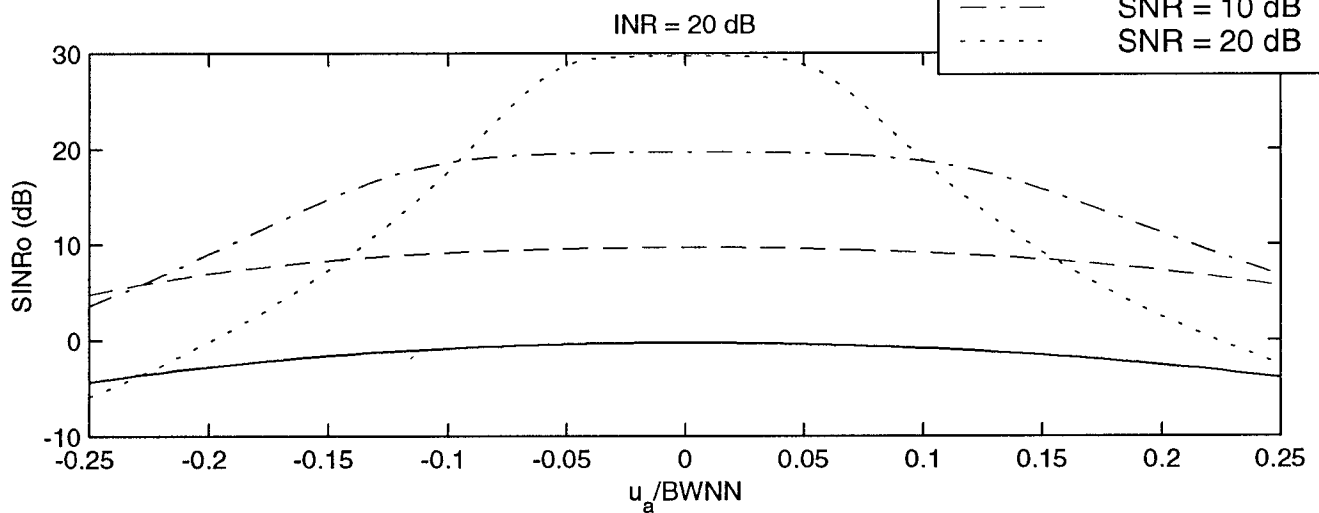
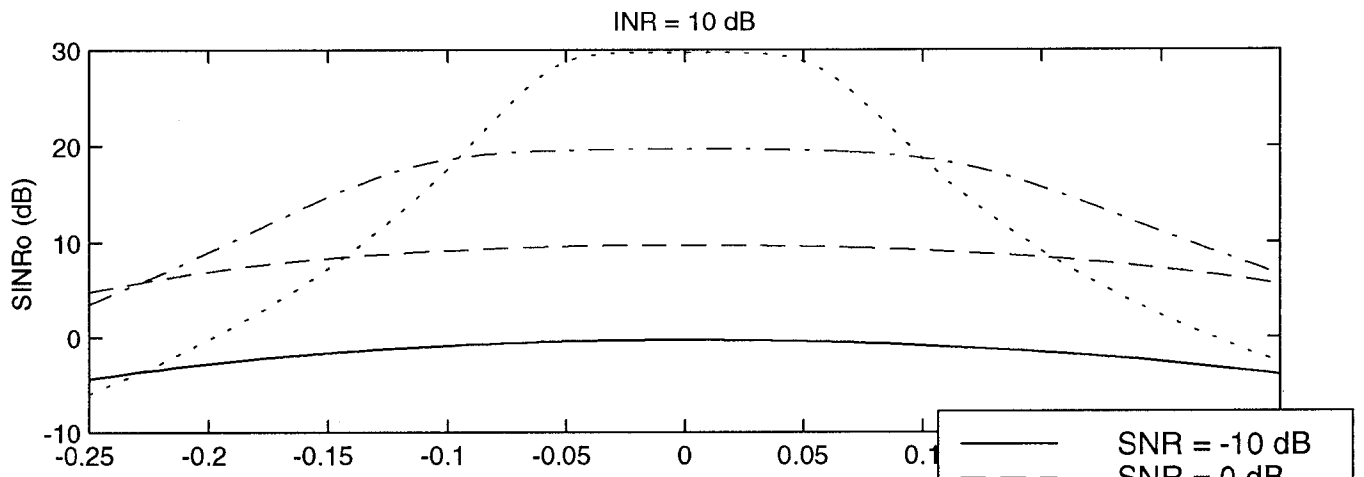
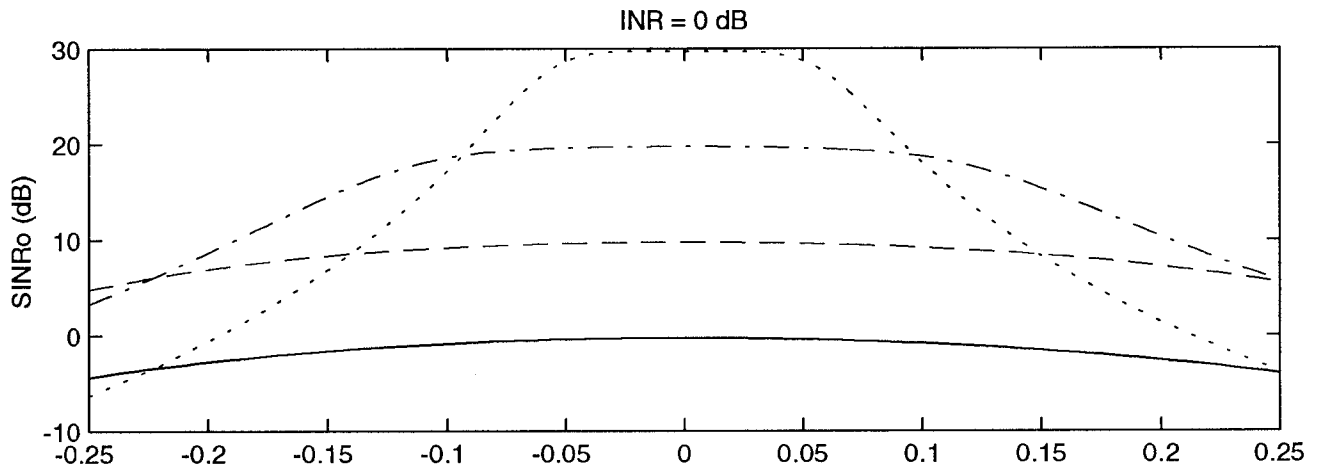
$$g = \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}$$



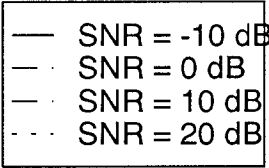
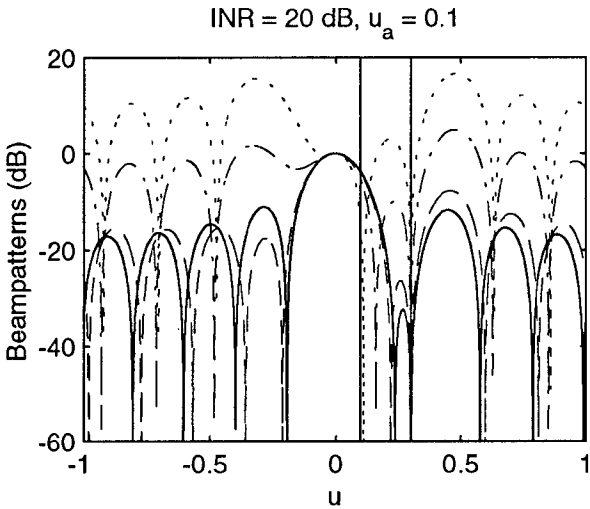
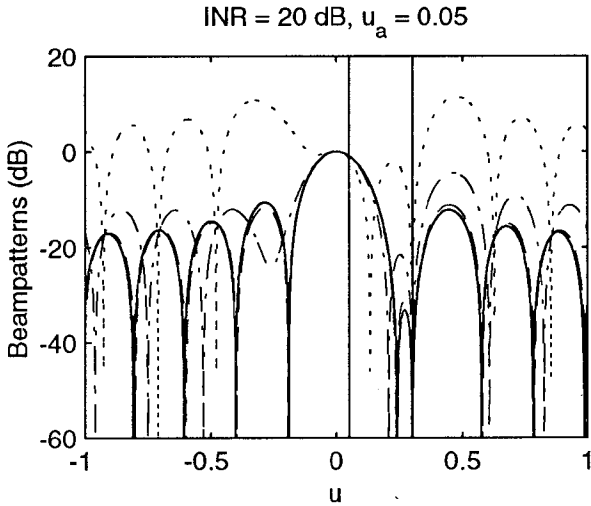
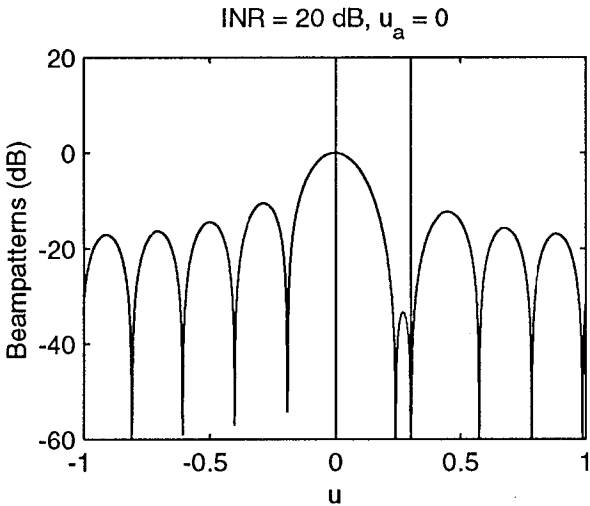
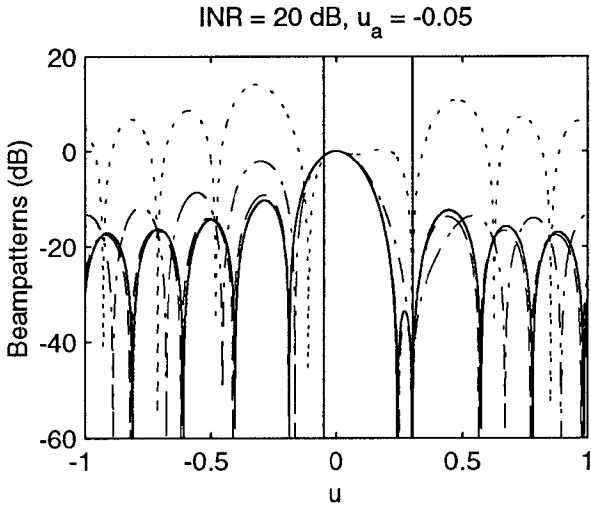
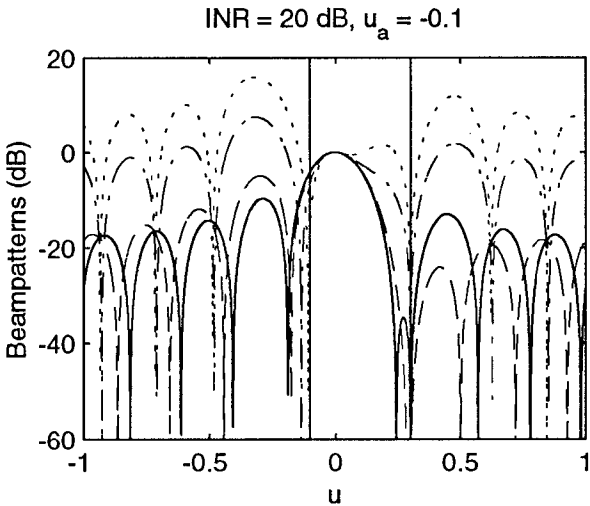
Derivative

$$g = \begin{bmatrix} 1 \\ 0 \\ \dot{F}_c(0) \end{bmatrix}$$

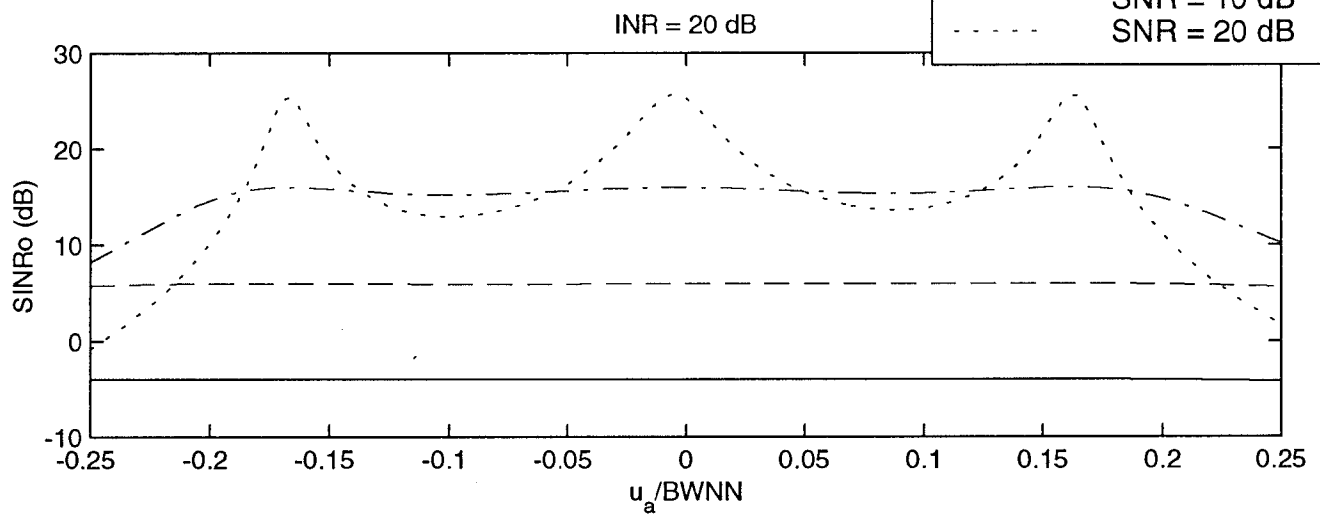
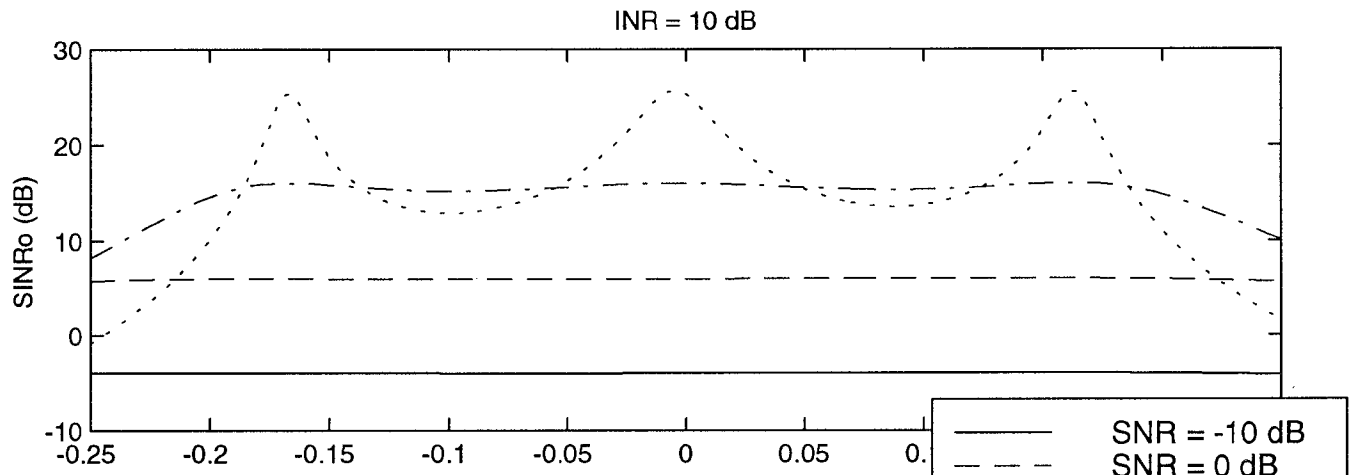
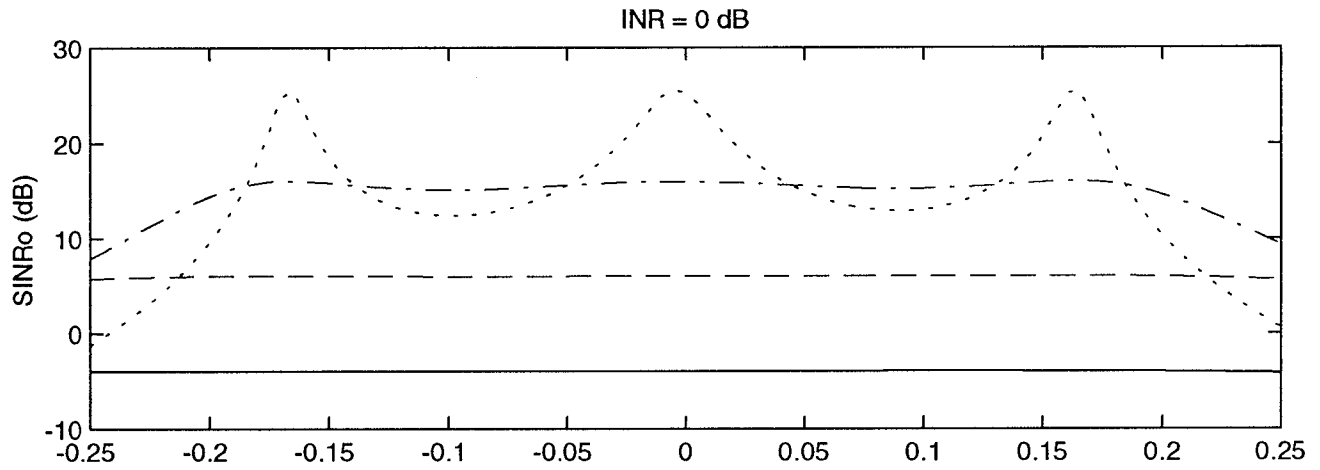
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Derivative, $g = \begin{bmatrix} 0 \\ B_c(0) \end{bmatrix}$

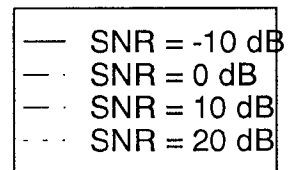
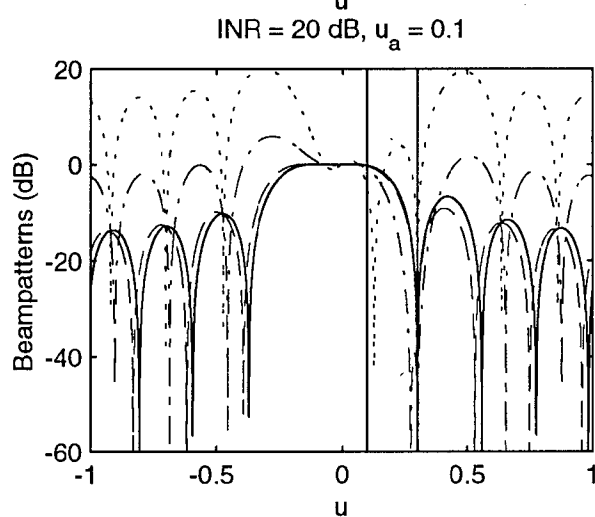
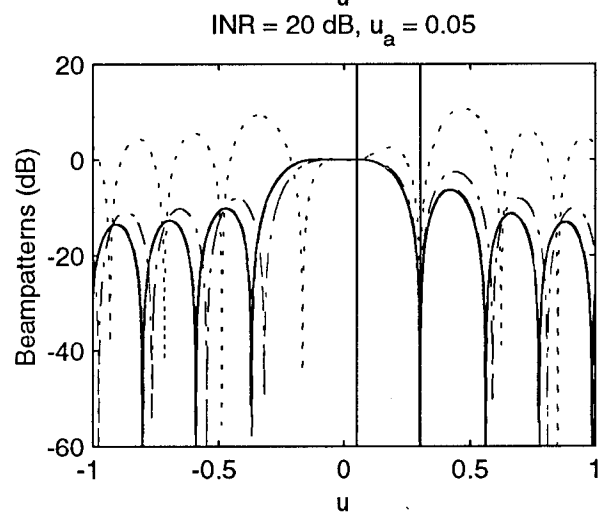
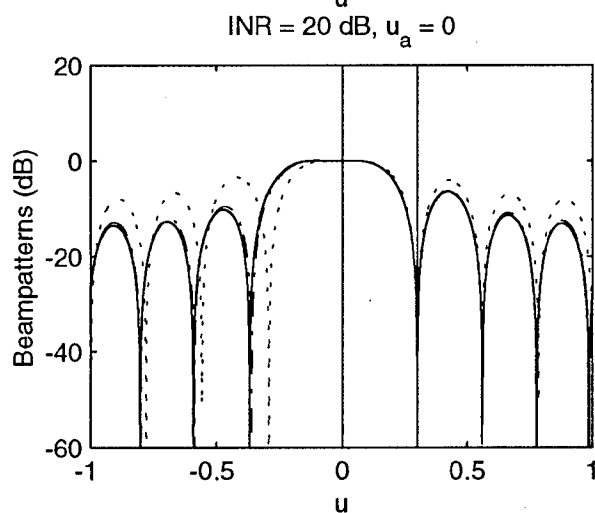
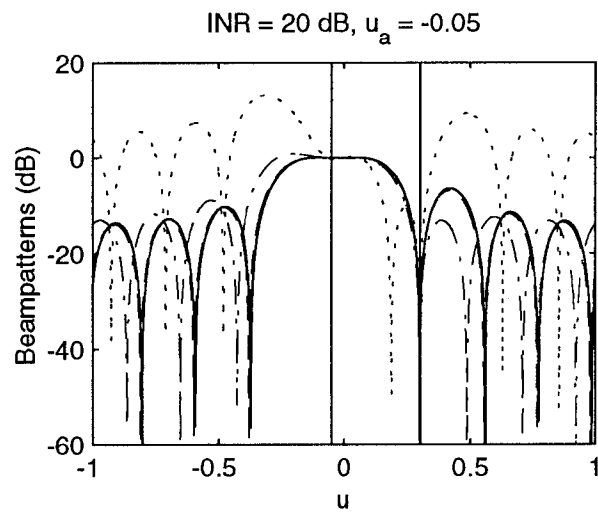
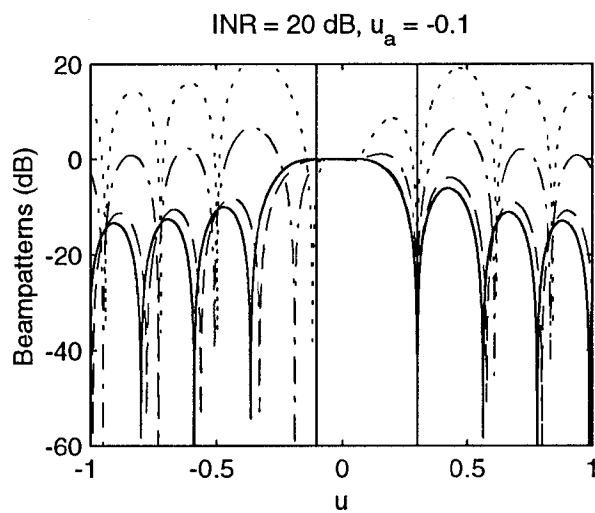


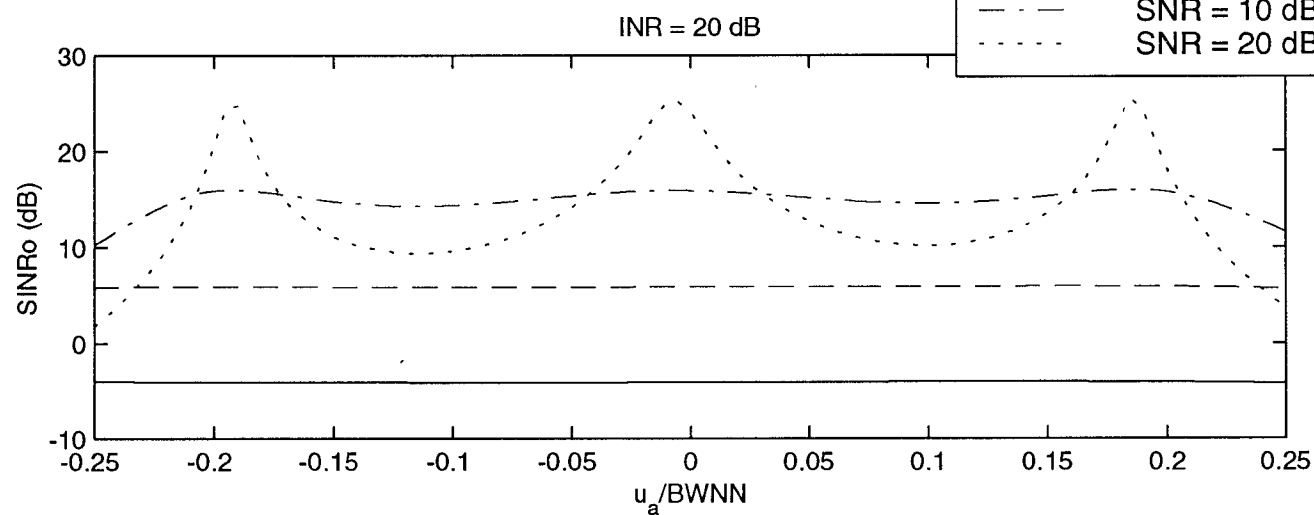
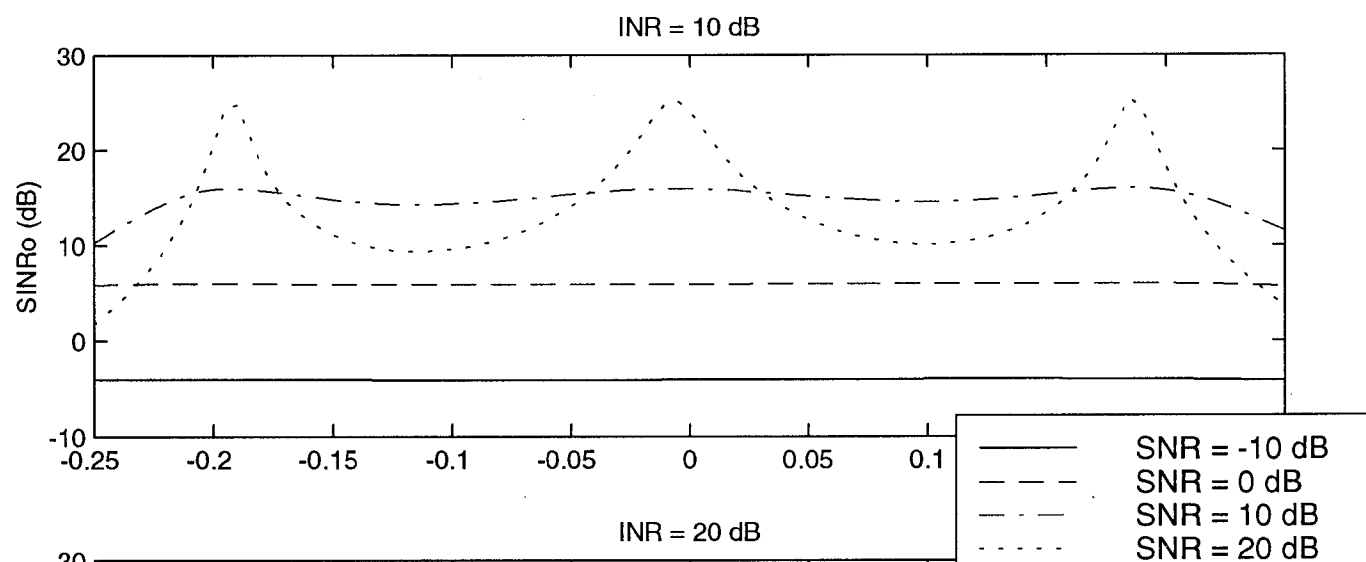
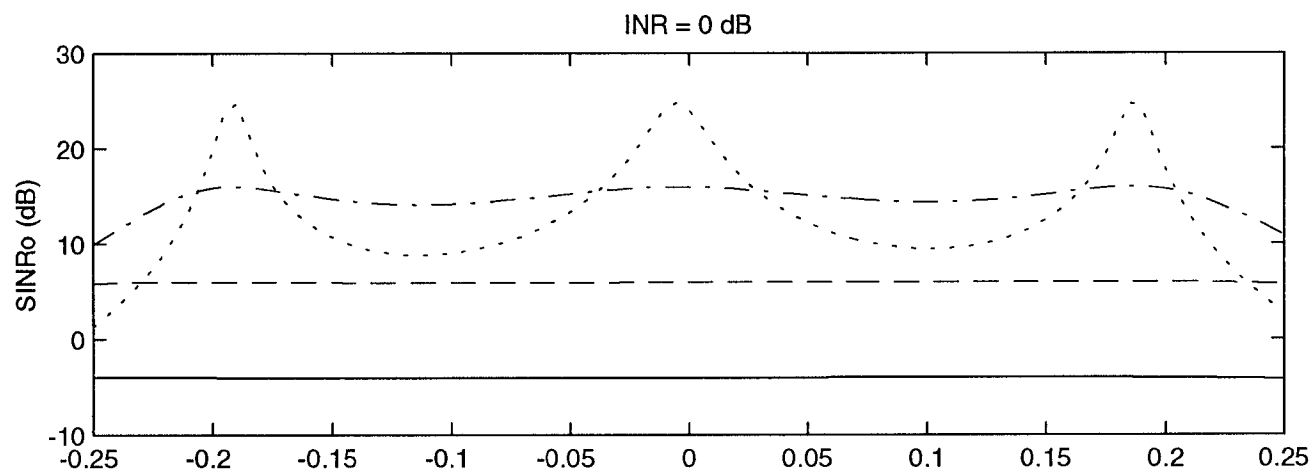
Eigenvector $Bd = I$ $|u| = 0.0866 = \text{HPBW}$



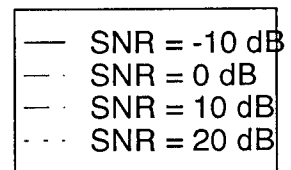
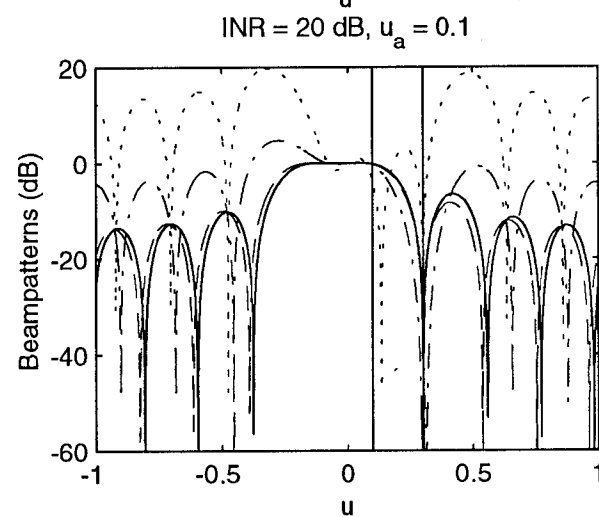
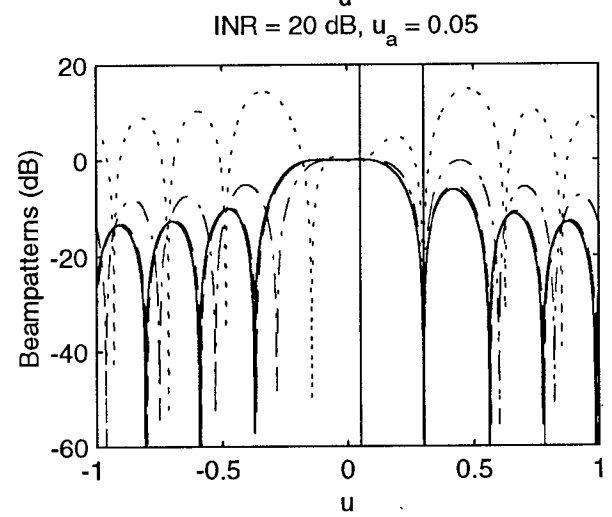
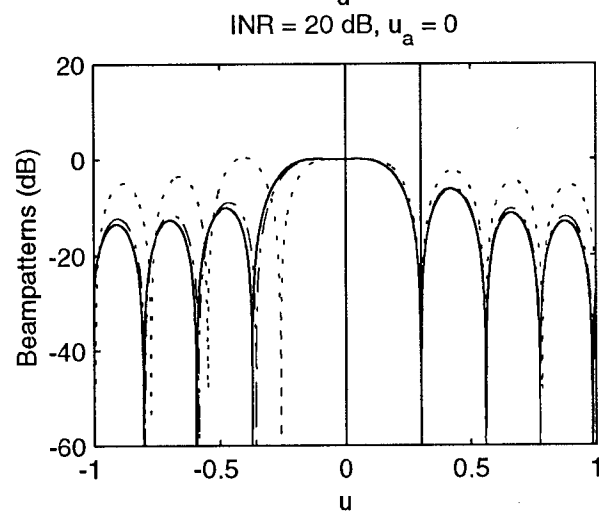
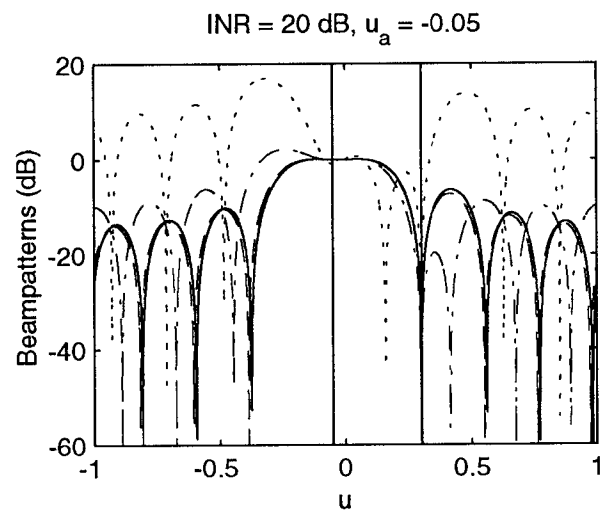
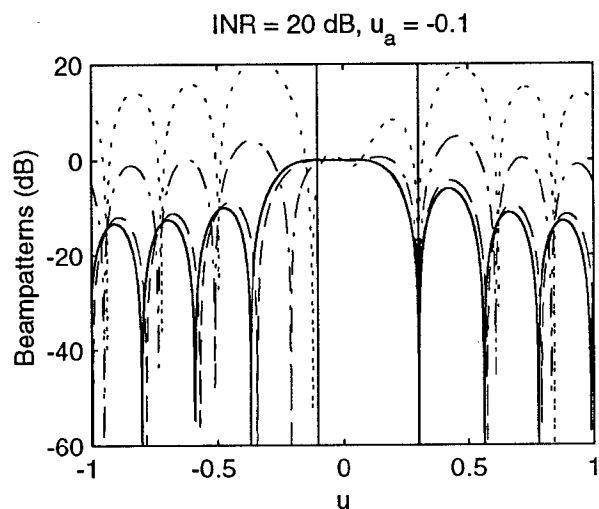
6.7.2 14/28

Eigenvector $B_d = 1$ $|u| \leq 0.0866 = \text{HPBW}$

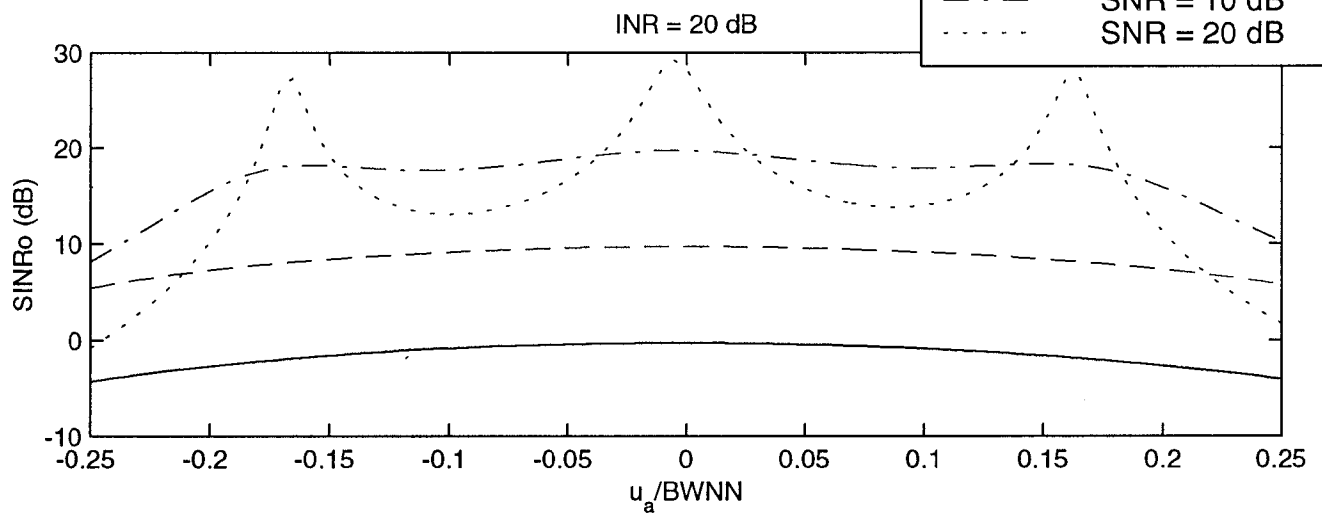
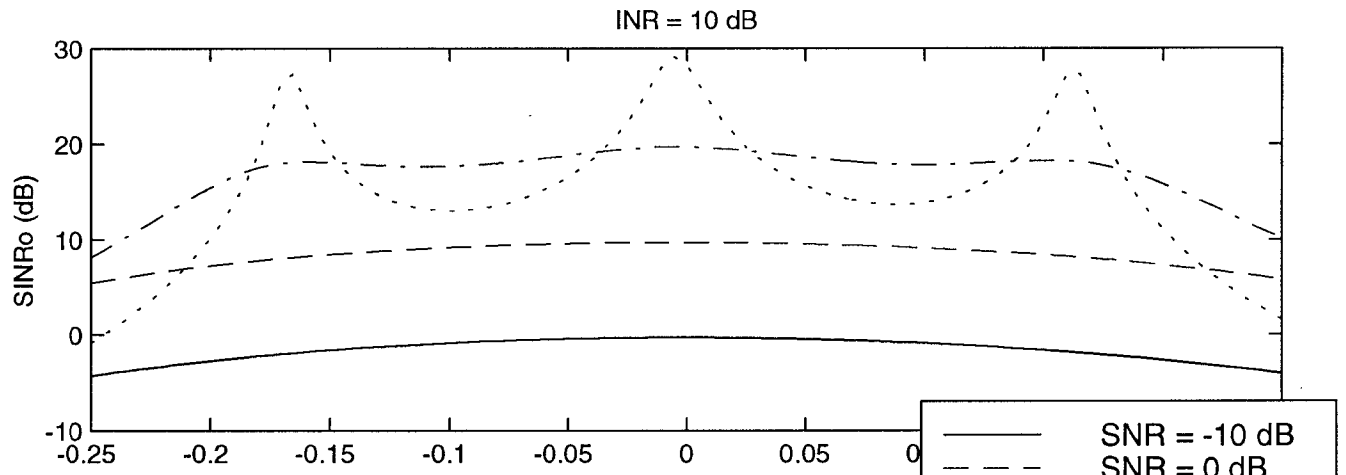
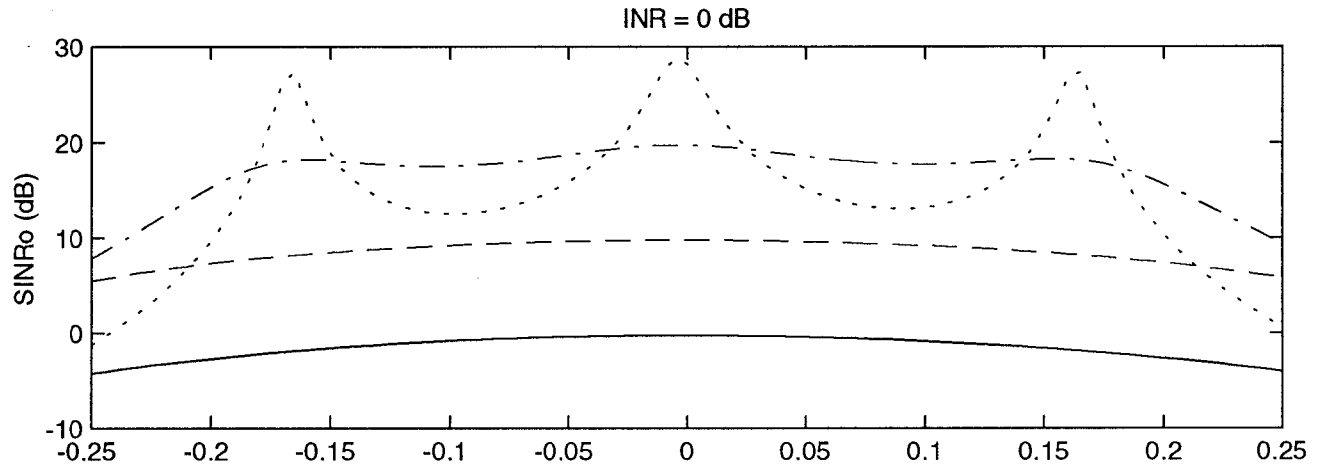


Eigenvektor $E_d = 1$ $|u| \leq 0.1$ 

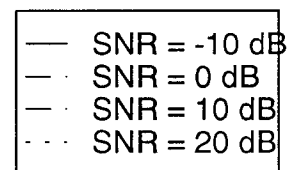
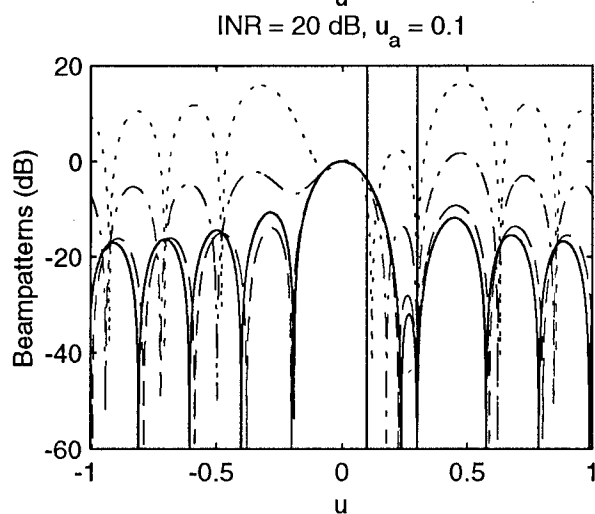
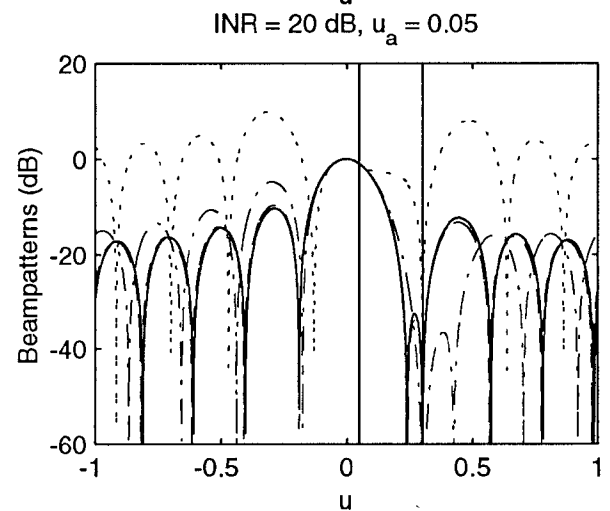
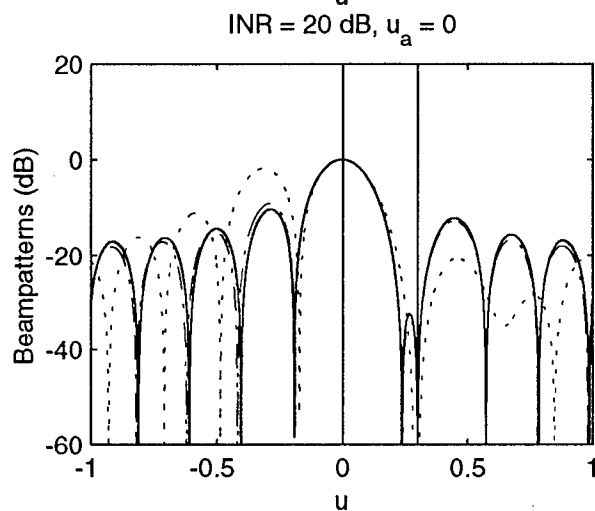
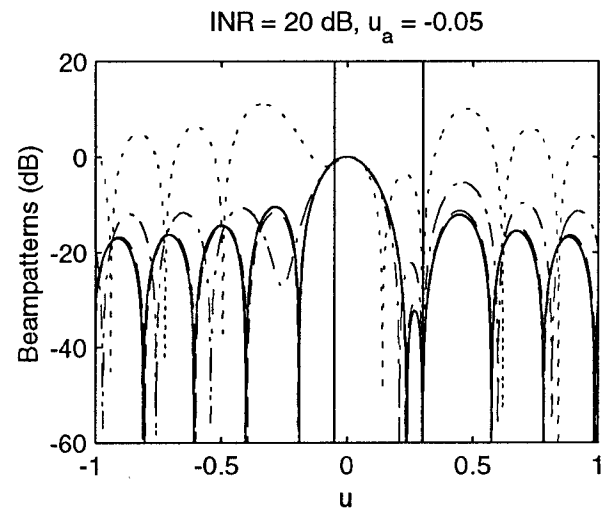
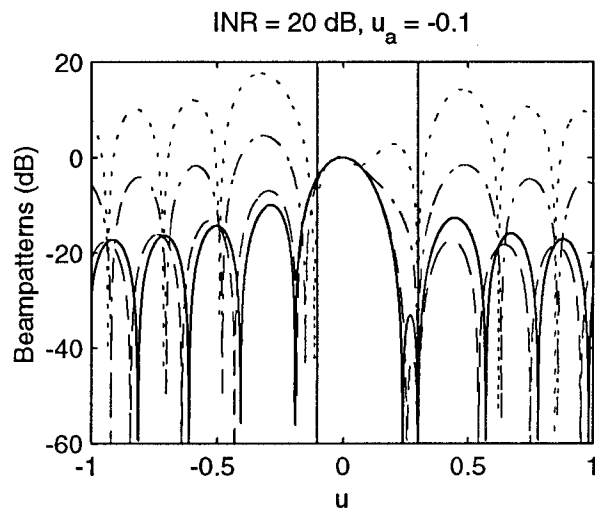
Eigenvector $B_d = 1$ $|a| \leq 0.1$



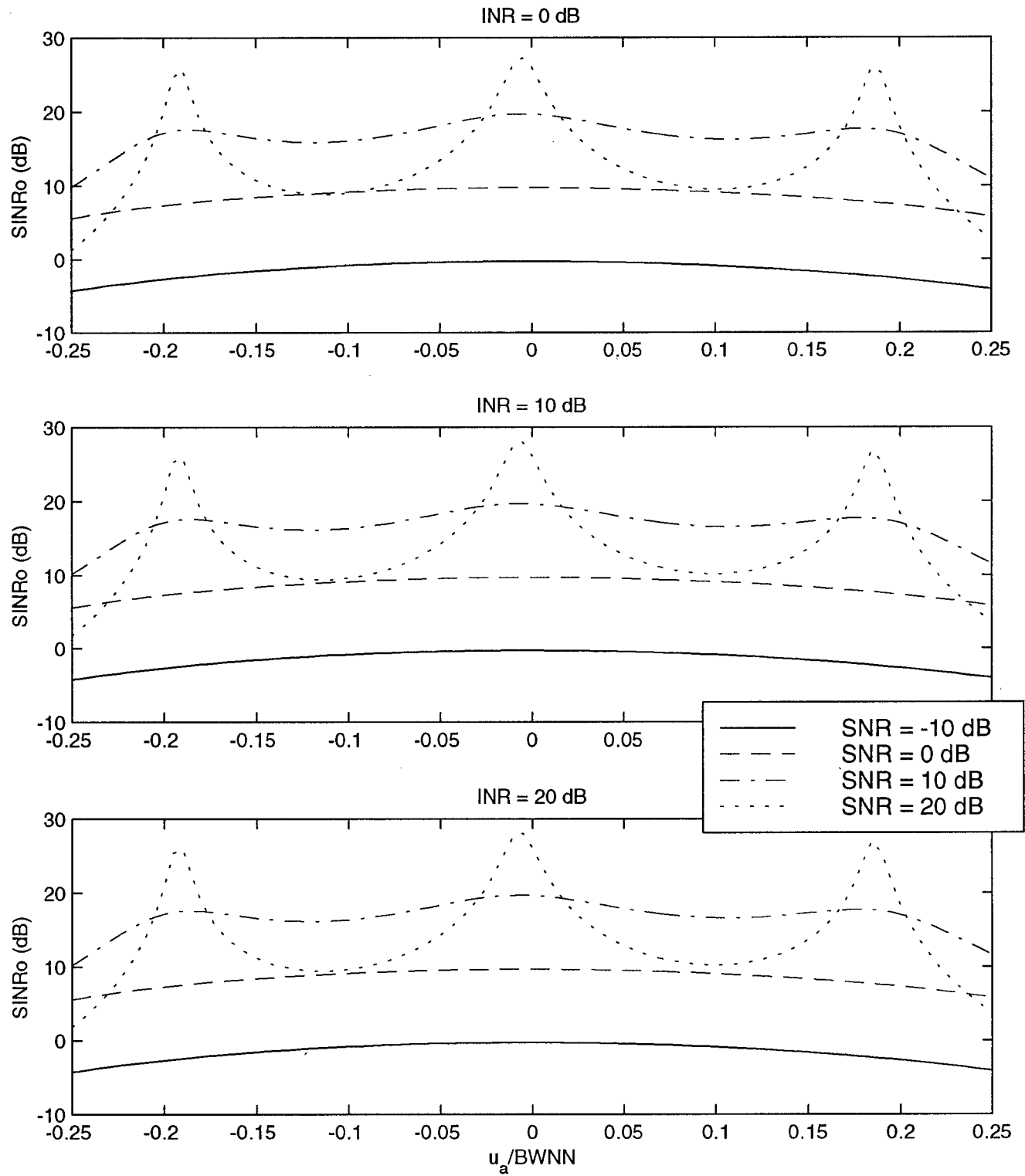
Eigenvektor $B_d = B_c$ $|u| \leq 0.0866 = \text{HPBW}$



Eigenvector $\mathbf{B}_d = \mathbf{B}_s$ $|u| \leq 0.0866 = \text{HPBW}$



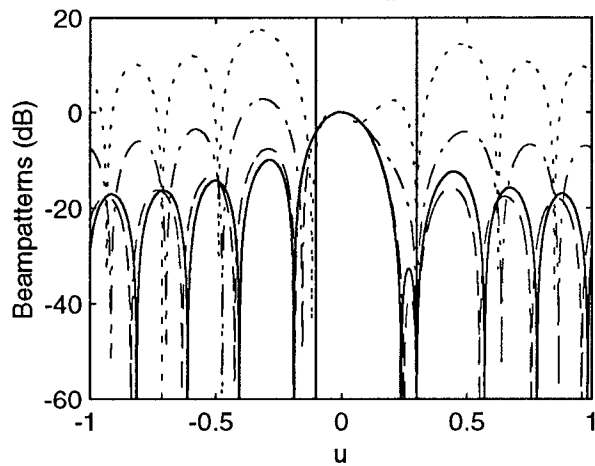
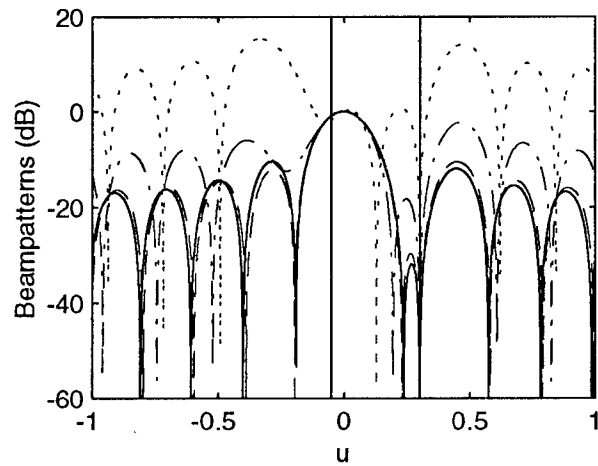
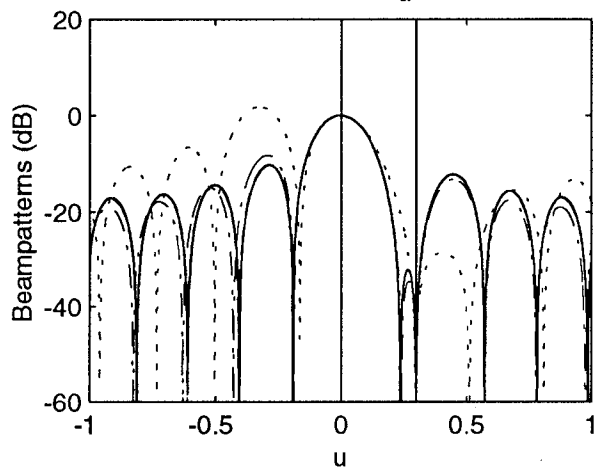
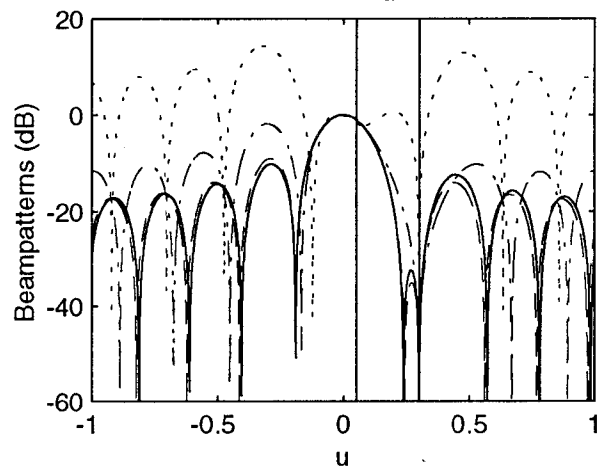
Eigenvector $B_d = B_s$ $|u| \leq 0.10$



Eigenvector

$$B_d = B_s$$

$$|u| \leq 0.1$$

INR = 20 dB, $u_a = -0.1$ INR = 20 dB, $u_a = -0.05$ INR = 20 dB, $u_a = 0$ INR = 20 dB, $u_a = 0.05$ INR = 20 dB, $u_a = 0.1$ 