静特性

データ: $y_1 \quad y_2 \quad y_3 \quad \cdots \quad y_n$

目標値: m

差分: $y_1 - m \quad y_2 - m \quad y_3 - m \quad \cdots \quad y_n - m$

信号: $M(=1)$

$$S_T = (y_1 - m)^2 + (y_2 - m)^2 + \cdots + (y_n - m)^2 \quad (f = n)$$

$$S_\beta = \frac{\{(y_1 - m)M + (y_2 - m)M + \cdots + (y_n - m)M\}^2}{n \times M^2} = \frac{L^2}{r}$$

$$= \frac{\{(y_1 - m) + (y_2 - m) + \cdots + (y_n - m)\}^2}{n}$$

$$= S_m$$

$$S_e = S_T - S_m$$

$$\eta = 10 log \frac{\frac{1}{n}(S_m - V_e)}{V_e}$$

静特性		動特性	
データ数	n	有効除数	r
データ	y	線形式	L
平均値	$\bar{y}$	平均傾き	β

$$\beta = \frac{\sum M_i y_i}{\sum M_i^2}$$

$M_i = 1$とすると

$$\beta = \frac{\sum y_i}{n} = \bar{y}$$

$$\beta = \frac{\sum M_i y_i}{\sum M_i^2} = \frac{L}{r}$$

Source	f	S	V
β	1	S_m	V_m
e	$n-1$	S_e	V_e
T	n	S_T	

動特性

	M_1	M_2	M_3	$\cdots$	M_n
N1	y_{11}	y_{21}	y_{31}	$\cdots$	y_{n1}
N2	y_{12}	y_{22}	y_{32}	$\cdots$	y_{n2}

$$S_T = {y_{11}}^2 + {y_{21}}^2 + {y_{31}}^2 + \cdots + {y_{n2}}^2 \quad (f = 2n)$$

$$L_1 = M_1 \times y_{11} + M_2 \times y_{21} + \cdots + M_n \times y_{n1}$$

$$L_2 = M_1 \times y_{12} + M_2 \times y_{22} + \cdots + M_n \times y_{n2}$$

$$S_\beta = \frac{(L_1 + L_2)^2}{2 \times r} = \frac{(M_1 \times y_{11} + M_2 \times y_{21} + \cdots + M_n \times y_{n2})^2}{2 \times ({M_1}^2 + {M_2}^2 + \cdots + {M_n}^2)} \quad (f = 1)$$

$$S_{N \times \beta} = \frac{{L_1}^2 + {L_1}^2}{r} - S_\beta = \frac{(L_1 - L_2)^2}{2 \times r} \quad (f = 1)$$

$$S_e = S_T - S_\beta - S_{N \times \beta} \quad (f = 2n - 2)$$

$$S_N = \boldsymbol{S_{N \times \beta}} + S_e = S_T - S_\beta \quad (f = 2n - 1)$$

$$\eta = 10 log \frac{\frac{1}{2r}(S_\beta - V_e)}{\boldsymbol{V_N}}$$

Source	f	S	V
β	1	S_β	V_β
$N \times \beta$	1	$S_{N \times \beta}$	$V_{N \times \beta}$
e	$2n-2$	S_e	V_e
T	$2n$	S_T	
N	$2n-1$	S_N	V_N