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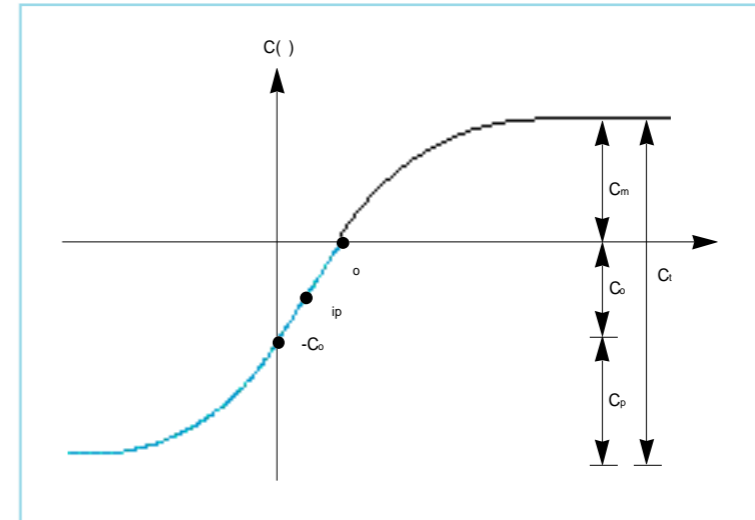
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Panet 1979

$$C(x) = C_0 (1 - \exp(-bx))$$

, C

b

x

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$$C(x) = C_0 (\exp(-bx_0) - \exp(-bx))$$

Otusuka(1981) Ke

Voigt

$$C(x) = a(1 - \exp(-bx))$$

+c(1-exp(

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x C(x)

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, a, b, c, d

x t

(C_i)

(C_m)

(C_o),

(C_p)

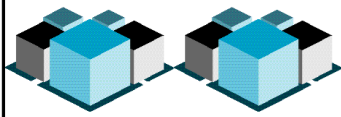
가 (Panet, 198

$$\frac{C(x)}{C} = 1 - \left(\frac{1}{1 + \frac{1}{r} \frac{1}{a}} \right)$$

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d : 1
 k :
 x₀ : ()
 x : ()

$$C(t) = C \left\{ 1 - \left(\frac{X}{X+a} \right)^2 \right\}$$

$$X \left[1+m \left\{ 1 - \left(\frac{T}{T+t} \right)^{0.3} \right\} \right]$$

X :
 T :
 C :

C (1+m) :



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$$C(t) = \frac{a}{1+e^{b(t-d)}} + d$$

$$C_i = C_m + C_o + C_p$$

$$K = C_p / C_i$$

a : (=C)
 b :

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	RMR/Q()
	(, ,)
	/
	/
	/
	(a d)

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(Steepest Descent Method),
 Gauss Newton , Levenberg-
 Marquardt
 1963 Marquardt
 Gauss Newton

λ

(k)

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$$C_i = C_m + C_o + C_p$$

$$C_p = ka$$

$$a = \frac{C_m + C_o}{1 - k}$$

$$d = -(C_o + C_p) = -\frac{C_o + kC_m}{1 - k}$$

Levenberg

Levenberg -

Marquardt

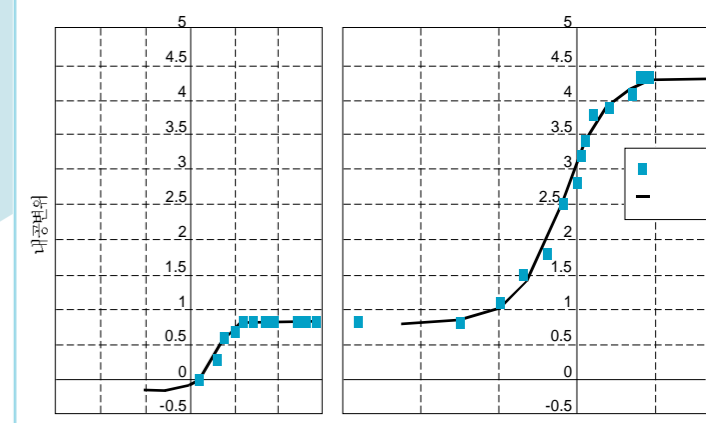
Levenberg -

Marquardt

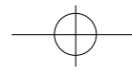
a, d

(0,

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(k)



$(x_0, 0)$

b C_0

$$-C_0 = \frac{a}{1+e^{-bc}} + d$$

$$0 = \frac{a}{1+e^{b(x_0-C)}} + d$$

$$C_0 = kC_m \left[\left(\frac{1-k}{k} \right)^{\frac{c}{C_0}} - 1 \right]$$

$$b = -\frac{\ln \frac{1-k}{k}}{C}$$

(i) $c (= ip)$

$k (0 < k < 1)$ 가

C_0 a, b, d

S

(C_{ei})

(ii) (C_{mi}) (C_{ei})

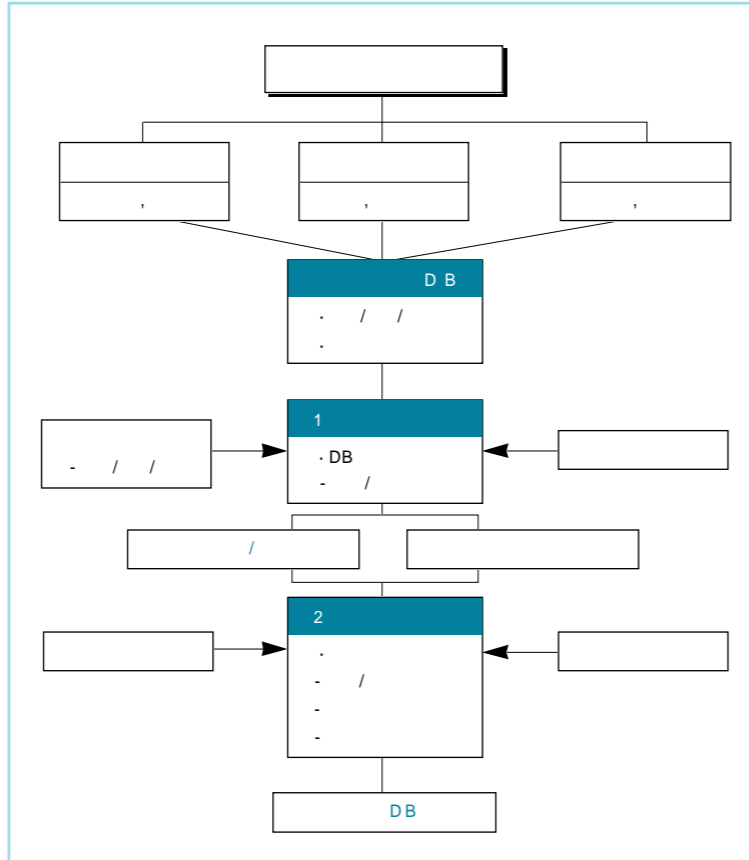
(AVR, Average Relative

$$AVR = \frac{1}{N} \sum_{i=1}^N \left| \frac{C_{mi} - C_{ei}}{C_{mi}} \right|$$

Error)

(iii) (i) (ii)

c, k



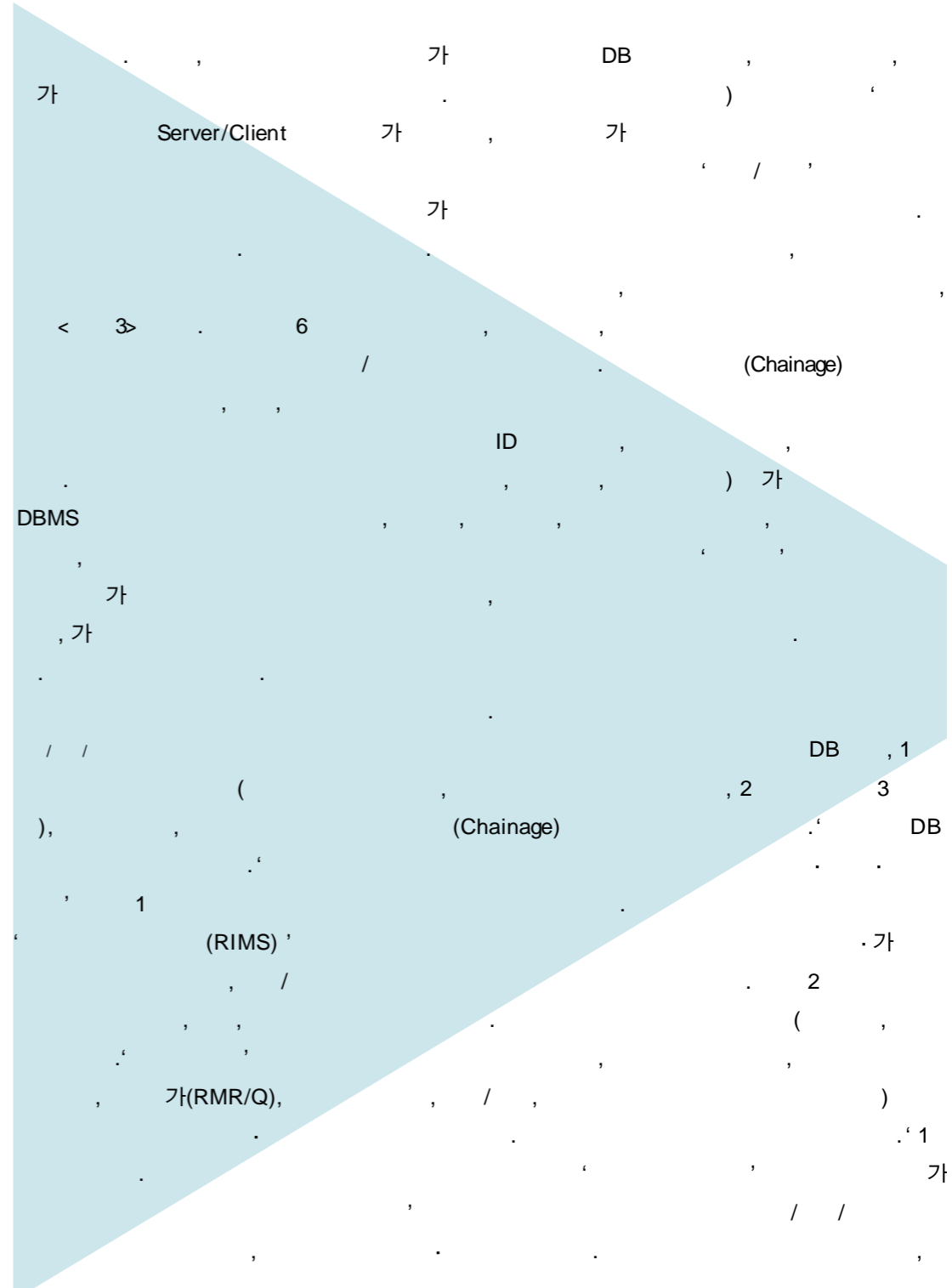
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Server/Client

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(Chainage)

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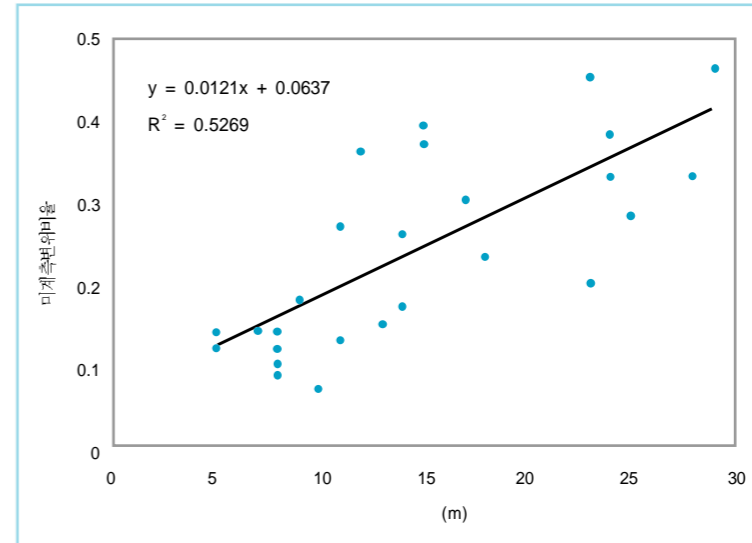
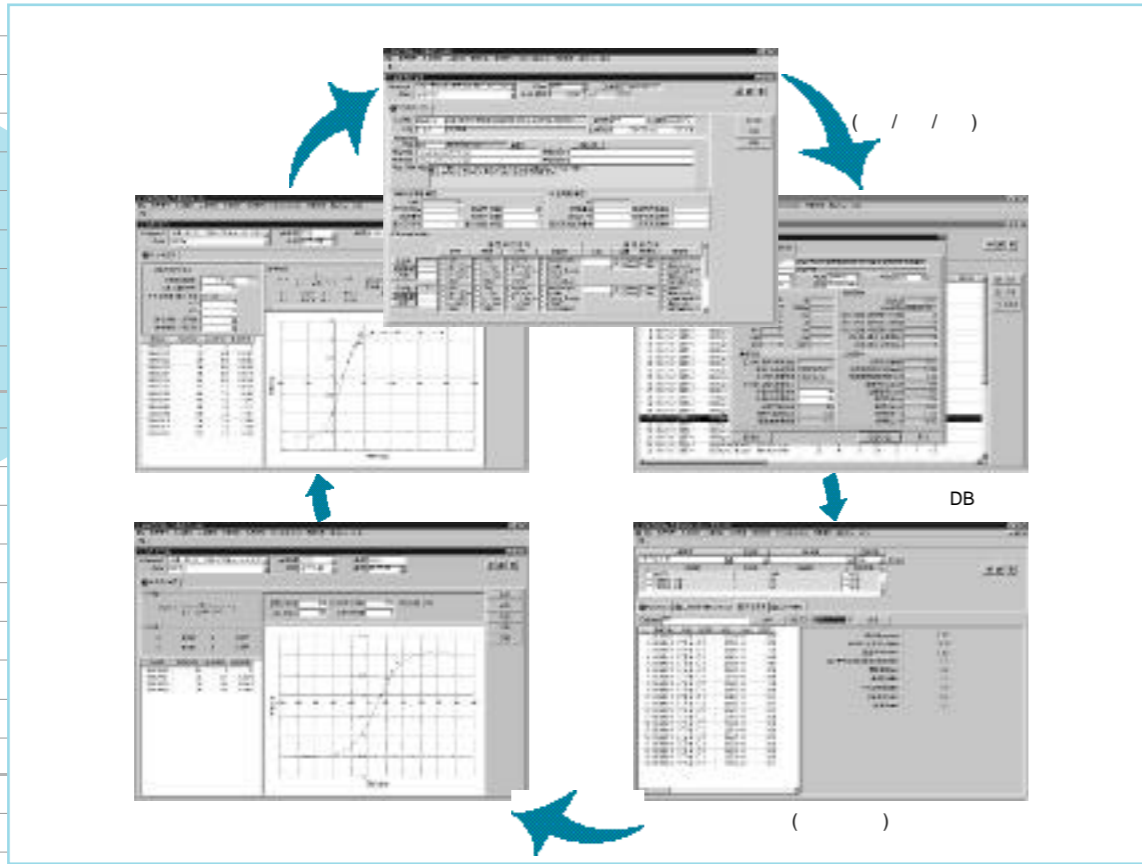
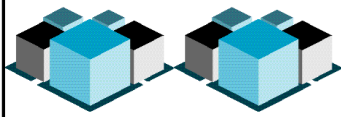
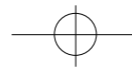
(RIMS)

가(RMR/Q),

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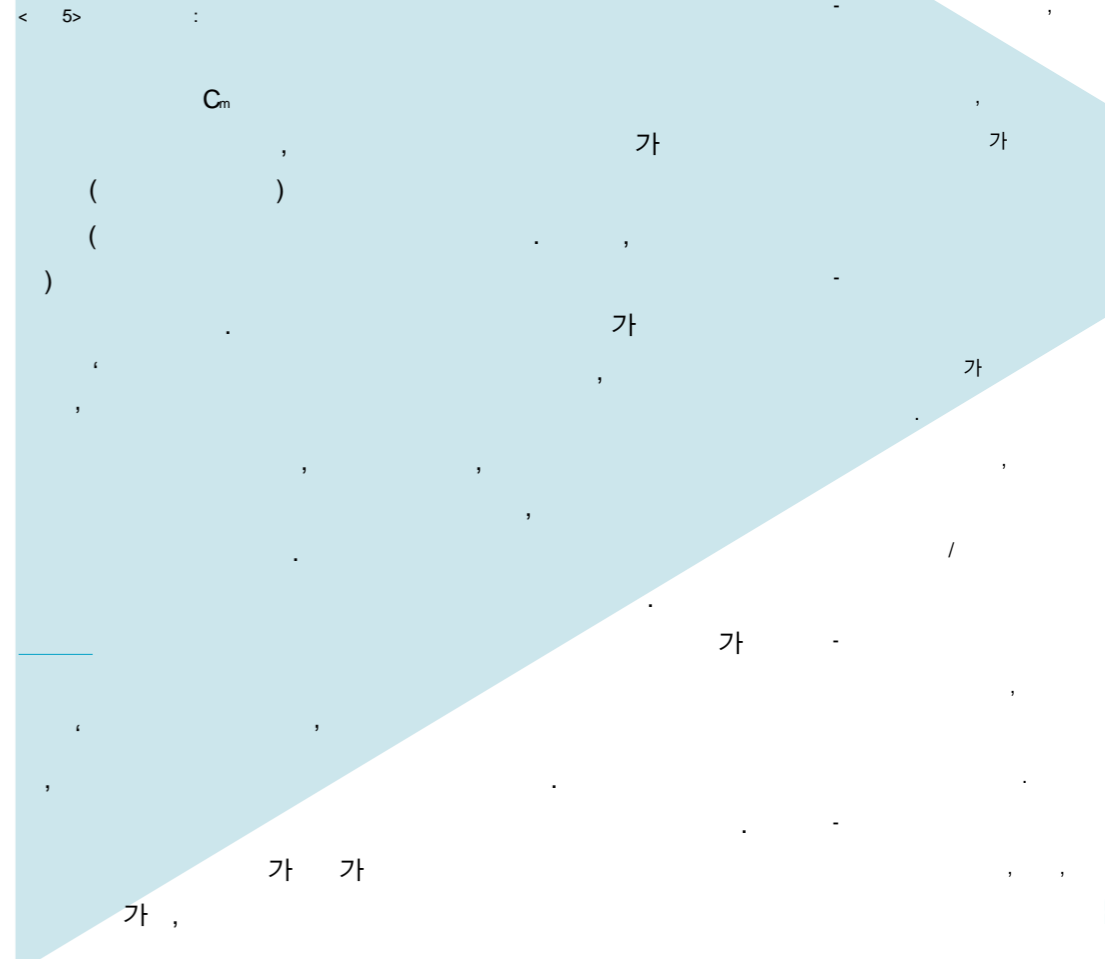
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Server/Client

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(, 1996)
k=0.3 가 . < 5>
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