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EAST CHINA ELECTRIC POWER TEST & RESEARCH INSTITUTE COMPANY LIMITED

测量不确定度评定

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uncertainty of measurement

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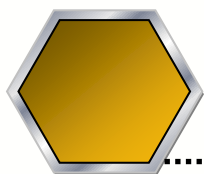
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S



1.5

$s(x_i)$



$$s(x_i) = \sqrt{\frac{\sum_{i=1}^n v_i^2}{n-1}} = \sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n-1}}$$

x_i

i

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n



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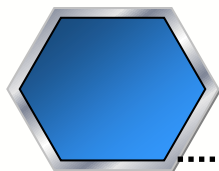
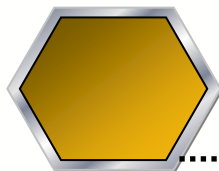
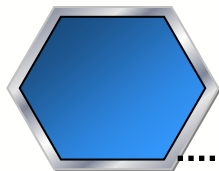
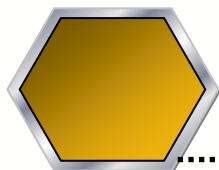
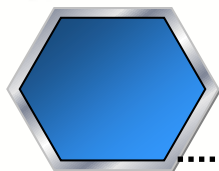
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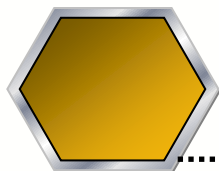
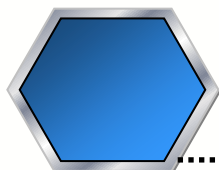
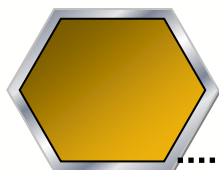
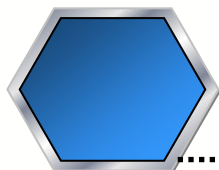
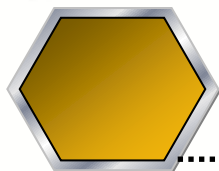
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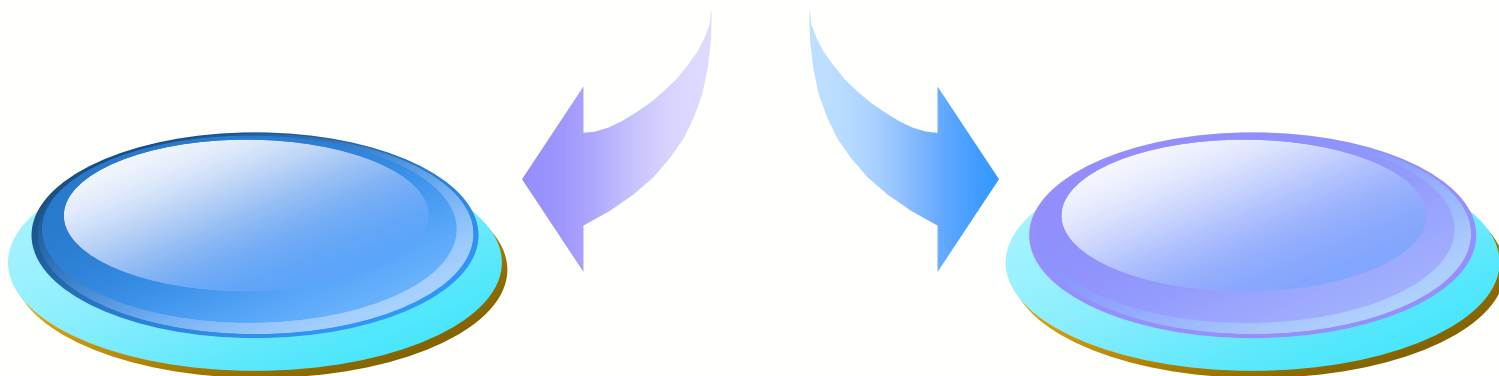




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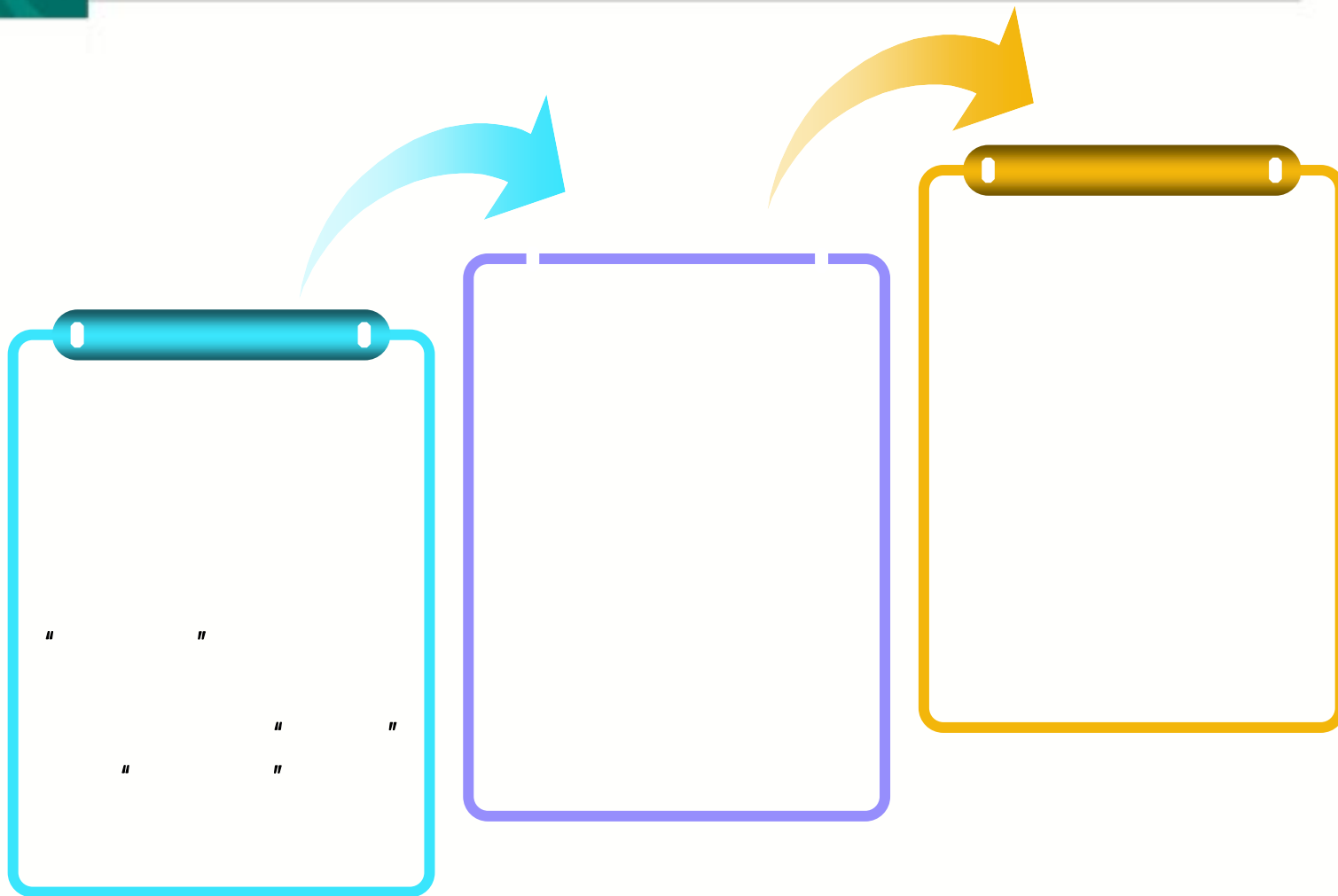


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$u \quad u \quad y \quad (y \quad)$



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$$N \quad X_1 \quad X_2 \quad \dots \quad X_N \quad Y \quad f$$

$$Y=f(X_1 \quad X_2 \quad \dots \quad X_N)$$

$$X_i \quad Y \quad y$$



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4.2

U

k

ξ

U(ξ)

s(ξ) k

k

$$u(\xi) = U(\xi)/k$$



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U_p

p

x_i

$s(x_i)$

k

U_{90}

U_{95}

U_{99}

90

95

99

$u(x_i)$



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$$u(x_i) = \frac{a}{k} \left(\frac{x_i - a}{x_i + a} \right)^k$$



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$\pm 1\%$

$[-0.01 \quad +0.01]$

$\pm 1\%$

a

0.01(1%)

$$u(x) = \frac{a}{k} = \frac{0.01}{\sqrt{3}} = 0.58\%$$



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5.1 X_i

X_i

$r \quad X_i \quad X_j \quad 0$

$$u_c(y) = \sqrt{\left[\sum_{i=1}^N c_i |u(x_i)| \right]^2} = \sqrt{\sum_{i=1}^N u_i^2}$$



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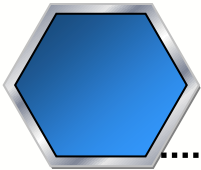
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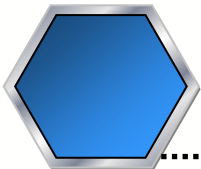
Y

X_i

Y



t-



Y

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Xi

u Xi



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U_c y Y V_{eff}
 U_c y Y V_{eff}



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X_i

Y

X_i

$N \geq 3$

Y

$Y \quad X_1 + X_2$

X_1

X_2

$u(x_1) \ll u(x_2)$



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k

Uc(y)

p

kp

t-

t

kp

tp

veff

p 95

veff >20

k95 ≈ 2



	Y	X1+X2	X1
X2		$u(x1) \ll u(x2)$	

k	2~3	kp	tp	veff	U(y)	Up(y)
		kp	Up(y)			
			U95(y)	kp	1.65	
			U99(y)	kp	1.71	



y $uc(y)$
 $Uc(y)$

$Uc(y)$

k U $kUc(y)$
 $[y-U \quad y+U]$

p 95

$k \approx 2$
 p 96.73

k 3



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- +



$$\begin{array}{l}
 \text{(inset limits)} \quad [X1 + U \quad X2 - U] \\
 \text{(outset limits)} \quad [X1 - U \quad X2 + U] \\
 \qquad \qquad \qquad \qquad \qquad \qquad X \qquad \qquad X2 \\
 \qquad \qquad \qquad \qquad \qquad \qquad U \qquad \qquad X2 \\
 (-\infty \quad X2 - U] \\
 (-\infty \quad X2 + U] \\
 \qquad \qquad \qquad \qquad \qquad \qquad X \qquad \qquad X1 \\
 \qquad \qquad \qquad \qquad \qquad \qquad U \qquad \qquad X1 \\
 [X1 + U \quad +\infty) \\
 [X1 - U \quad +\infty)
 \end{array}$$



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THE END

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