

June, 1958 Fermi, β -distribution
中の近似式のdeduction.
各mの値

$$F(\eta) = \eta^{1.6} e^{0.6\pi \frac{\sqrt{1+\eta^2}}{\eta}} \left| \Gamma\left(0.8 + 0.6i \frac{\sqrt{1+\eta^2}}{\eta}\right) \right|^2 \approx 4.5\eta + 1.6\eta^2$$

$$x = -0.2 \quad y = 0.6 \frac{\sqrt{1+\eta^2}}{\eta} \quad \eta < 10.$$

$$\left| \Gamma\left(0.8 + 0.6i \frac{\sqrt{1+\eta^2}}{\eta}\right) \right|^2 = \left| \Gamma(1+x+iy) \right|^2$$

η の非零 = 小さい範囲を除外して $1 \leq \eta \leq 10$ である。 $y < 1$.

この範囲では

$$\left| \Gamma(1+x+iy) \right|^2 \sim \left[\frac{\pi^2(x^2+y^2)}{\sin^2\pi x + \sinh^2\pi y} \frac{(1-x)^2+y^2}{(1+x)^2+y^2} \right]^{\frac{1}{2}}$$

y^2, x^2 を neglect すると

$$\sim \left[\frac{\pi^2 y^2}{\sinh^2\pi y} \frac{1-2x+y^2}{1+2x+y^2} \right]^{\frac{1}{2}} = \frac{2\pi y}{e^{\pi y} - e^{-\pi y}} \sqrt{\frac{1-2x+y^2}{1+2x+y^2}}$$

$$\sim \frac{2\pi y}{e^{\pi y}(1-e^{-2\pi y})} \left\{ 1 + \frac{1}{2}(2x+y^2) \right\} \left\{ 1 - \frac{1}{2}(2x+y^2) \right\}$$

$$\approx \frac{2\pi y}{e^{\pi y}(1-e^{-2\pi y})} \left\{ 1 + \frac{1}{2}(-2x+y^2) - \frac{1}{2}(2x+y^2) \right\}$$

$$= \frac{2\pi y}{e^{\pi y}(1-e^{-2\pi y})} \{1-2x\}. \quad //$$

$$F(\eta) = \eta^{1.6} e^{\pi y} \frac{2\pi y}{(1-e^{-2\pi y})} \{1-2x\} = \eta^{1.6} \frac{2\pi y}{1-e^{-2\pi y}} (1-2x)$$

$$\sim \eta^{1.6} 2\pi y (1-2x) = 2\pi \cdot \eta^{1.6} \frac{0.6\sqrt{1+\eta^2}}{\eta} \times 1.4.$$

$$\sim 5.1 \times \eta^{1.6} \frac{\sqrt{1+\eta^2}}{\eta} //$$

$$\eta=1. \quad \bar{r}(\eta) \sim 5.1 \times \eta^{1.6} \times 1.4$$

$$\eta=2. \quad F(\eta) \sim 5.1 \times \eta^{1.6} \times 1.1$$

$$\eta=3 \quad " \quad 5.1 \times \eta^{1.6}$$

!!

トスル

$\eta=1.$	$7.1 = A + B$	a	b	c	s
2.	$15.3 = A2 + B4$	1	1	-7.1	-5.1
3.	$29.0 = A3 + B9$	2	4	-15.	9.0
4	$46 = A4 + B16$	3	9	-29.	17.
5	$67 = A5 + B25$	4	16	-46.	26
6	$89 = A6 + B36$	5	25	-67	37
7	$110 = A7 + B49$	6	36	-89	47
8	$140 = A8 + B64$	7	49	-110.	54
9	$170 = A9 + B81$	8	64	-140	68
10	$200 = A10 + B100$	9	81	-170	80
		10	100	-200	90.

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DATE

NO.

aa	ab	ac	as
1	1	-7.1	-5.1
4	8	-30.	-18
9	27	-87.	-51.
16	64	184.	-104.
25.	125	335.	-185.
36.	216	534.	282.
49.	343	-770	-378.
64.	512	-1120	-544.
81.	729	-1530	-720.
100	1000	-2000.	-900
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385	3025	6597.1	3187.1
ab	bb	bc	bs
1	1	-7.1	-5.1
8	16	-60.0	-36.
27	81	261.0	-153.
64	256	736.0	416.
125	625	1675.	925.
216	1296	3204	1692
343	2401	5430	2686
512	4096	-8960	-4352
729	6561	13770	6480
1000	10000	20000	9000
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3025	25333	54103.1	25738.1 25745.1

$$\begin{aligned} 385A + 3025B &= 6597.1 \\ 3025A + 25333B &= 54103.1 \end{aligned}$$

$$A = \frac{\begin{vmatrix} 6597.1 & 3025 \\ 54103.1 & 25333 \end{vmatrix}}{\begin{vmatrix} 385 & 3025 \\ 3025 & 25333 \end{vmatrix}} \approx \frac{33 \times 10^6}{5.8 \times 10^6} \sim 5.6 \sim 5.7.$$

$$B = \frac{\begin{vmatrix} 385 & 6597.1 \\ 3025 & 54103.1 \end{vmatrix}}{\begin{vmatrix} 385 & 3025 \\ 3025 & 25333 \end{vmatrix}} \approx \frac{8.4 \times 10^6}{5.8 \times 10^6} \sim 1.5.$$

$$F(\eta) = 5.6\eta + 1.5\eta^2$$