R ‡ X s O

} ` J m j J

e J v

H c @ ...[A,B] ″

James E. Gubernatis[B]

[A] ´ R w @ w E ¤

[B] *Los Alamos National Laboratory*

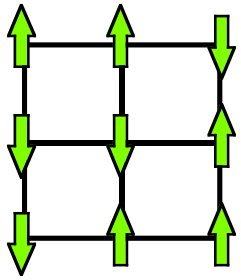
}J ″ ^

$$H = -\sum_{\alpha=1,2} \sum_{\langle i,j \rangle} J_{ij} \sigma_i^{(\alpha)} \sigma_j^{(\alpha)}$$

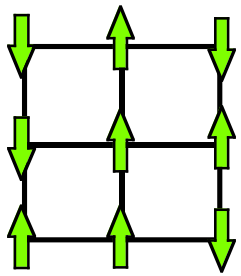
$J_{ij} = \pm 1$ i - Ł j

I [o [b v ˇ

$$q = \frac{1}{N} \sum_{i=1}^{N} \sigma_i^{(1)} \sigma_i^{(2)}$$



replica 1

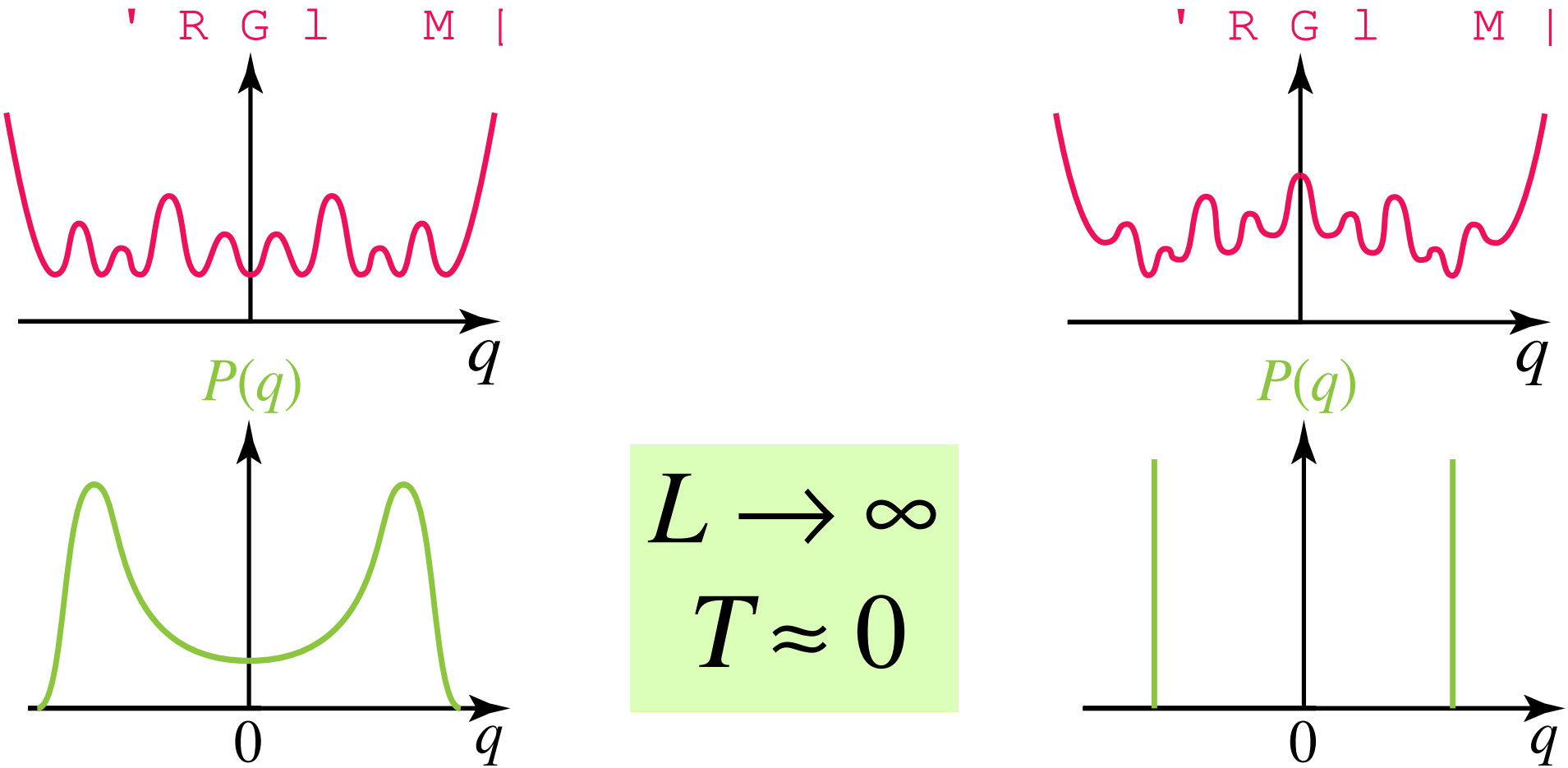


replica 2

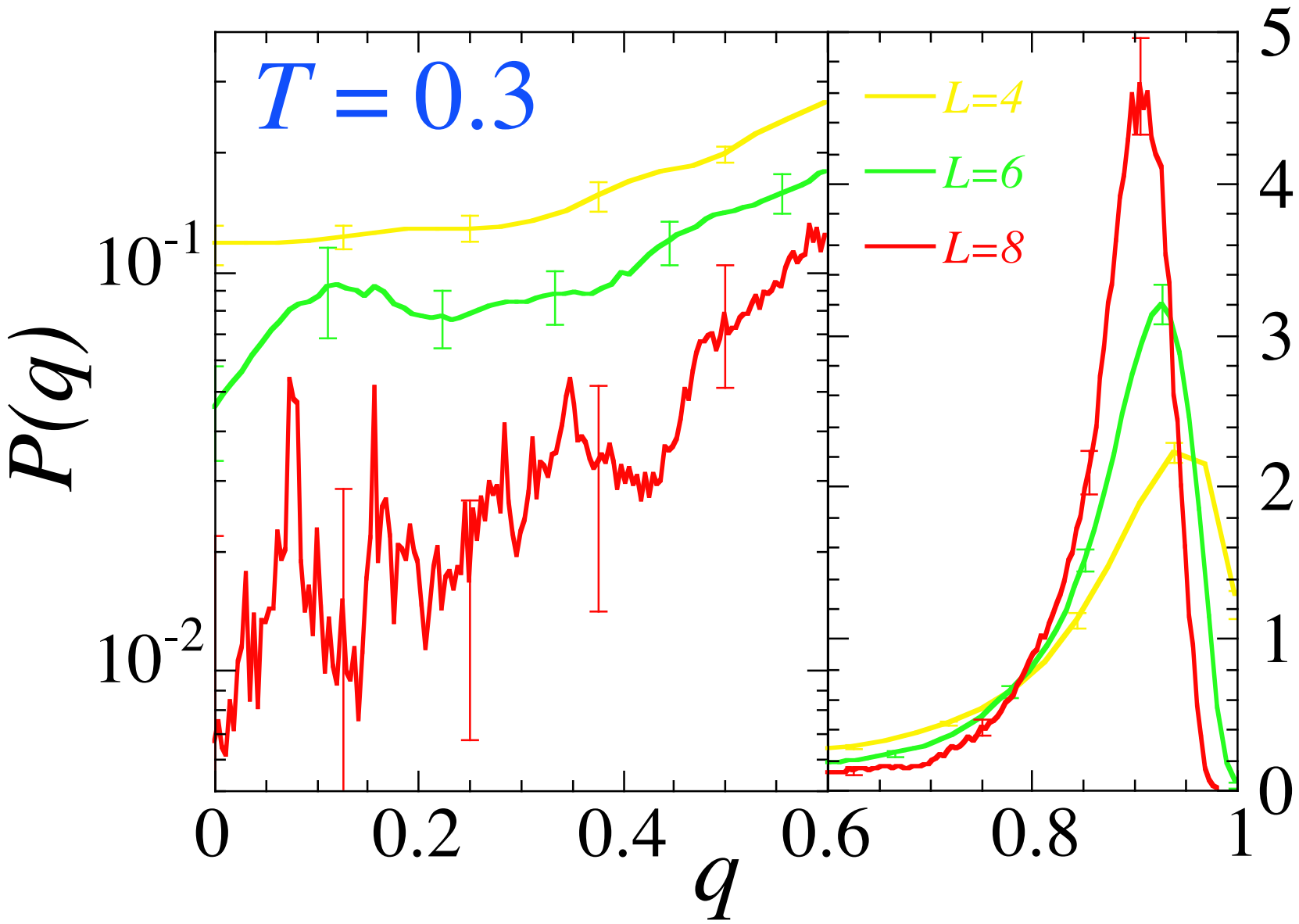
Æ • « ¿

‰ ˇ Œ ` t H `

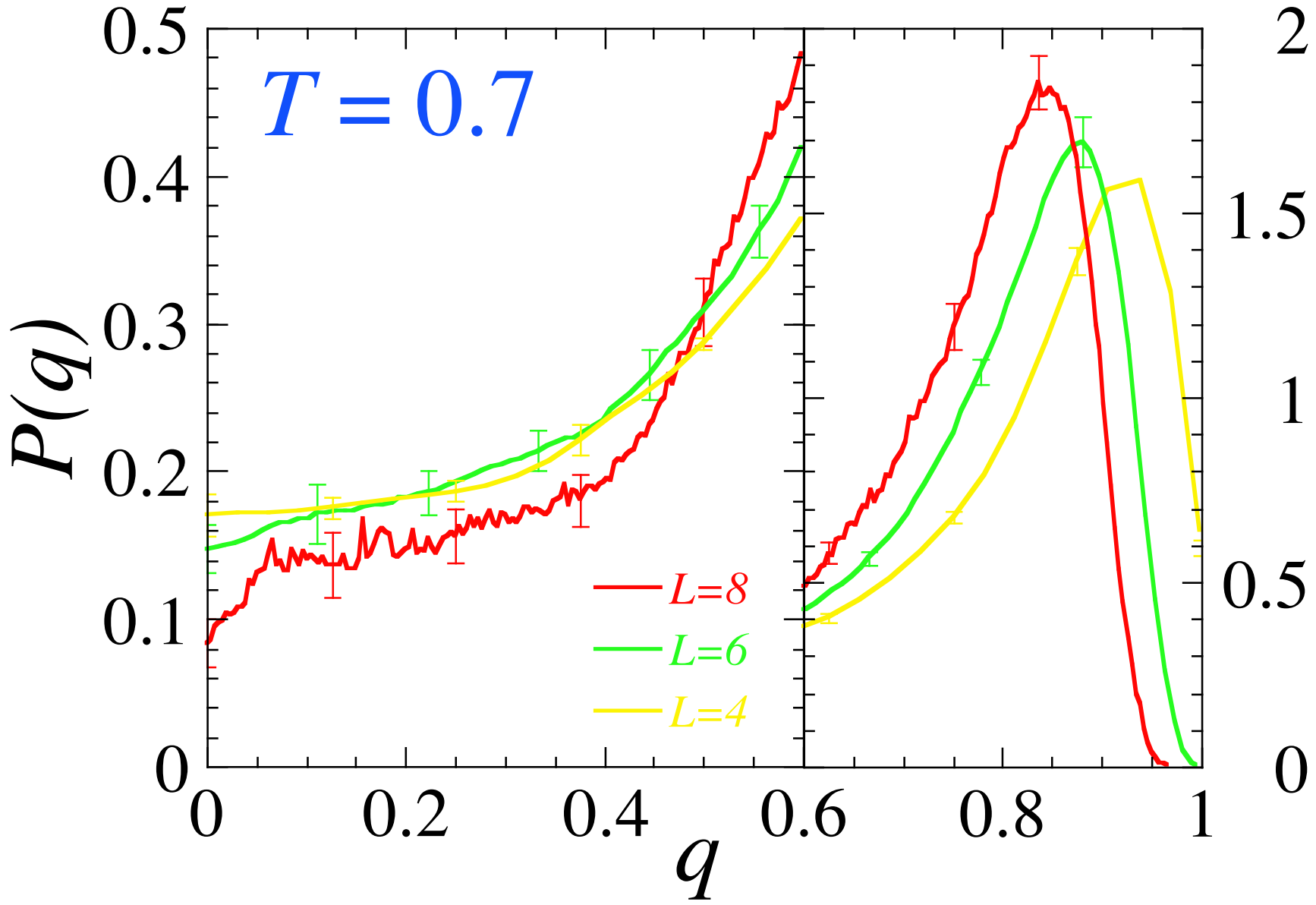
(Parisi *et al.*) (Fisher & Huse)



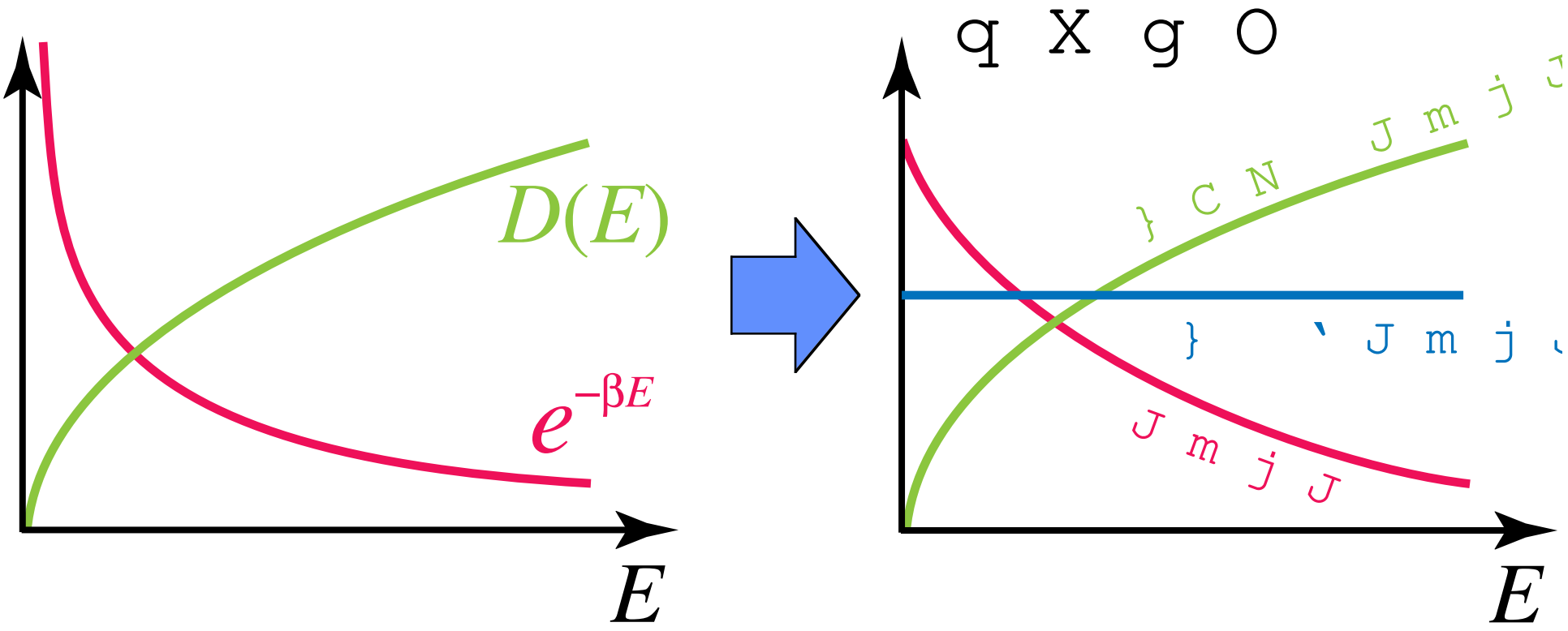
$$L \to \infty$$
$$T \approx 0$$



T = 0.3
L=4
L=6
L=8
P(q)
q
10^-1
10^-2
0
0.2
0.4
0.6
0.8
1
0
1
2
3
4
5


T = 0.7
P(q)
q
L=8
L=6
L=4
0.5
0.4
0.3
0.2
0.1
0
0
0.2
0.4
0.6
0.8
1
2
1.5
1
0.5
0

} ` J m j J E e J



} C N J m j JF Æ G l M [" ›

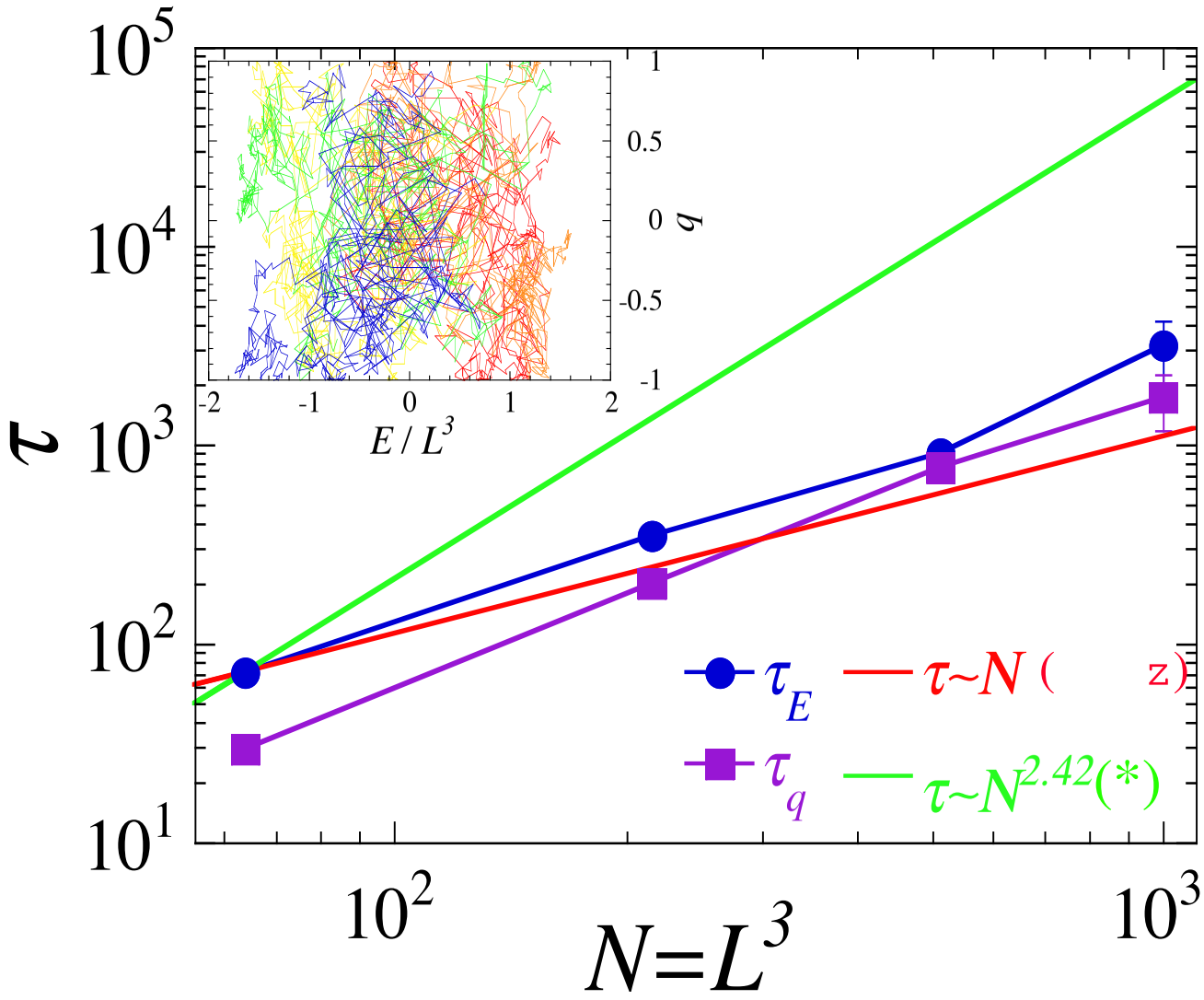
J m j J F G l M [" › ¨ ¢ ‰

@ @ @ @ @ @ ' R G l M [‹ Œ ∅

} ` J m j JF · G l M [Œ l

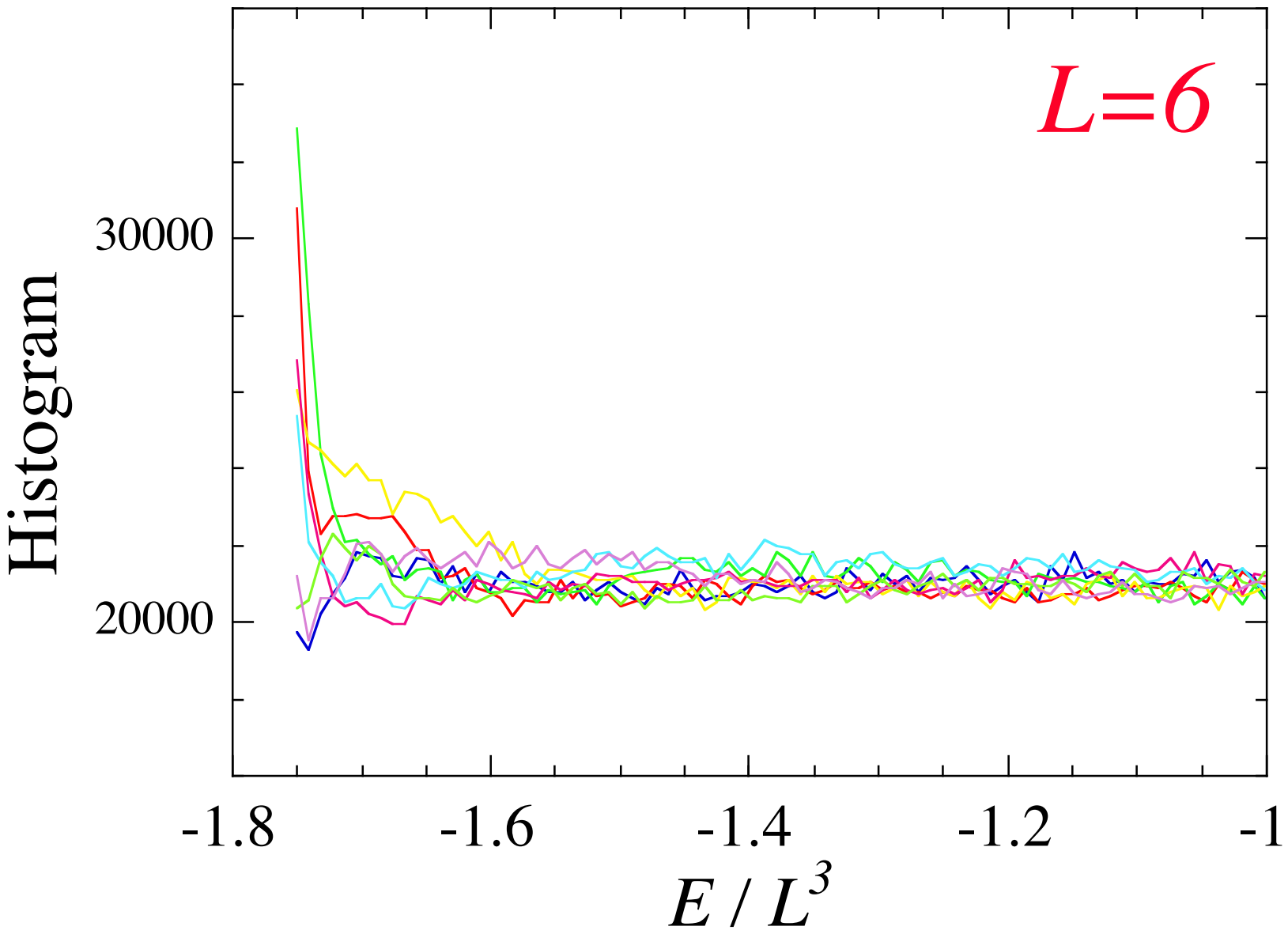
æ ˇ } ' J m j J

æ ˇ q x g O $h(E,q$ ‰

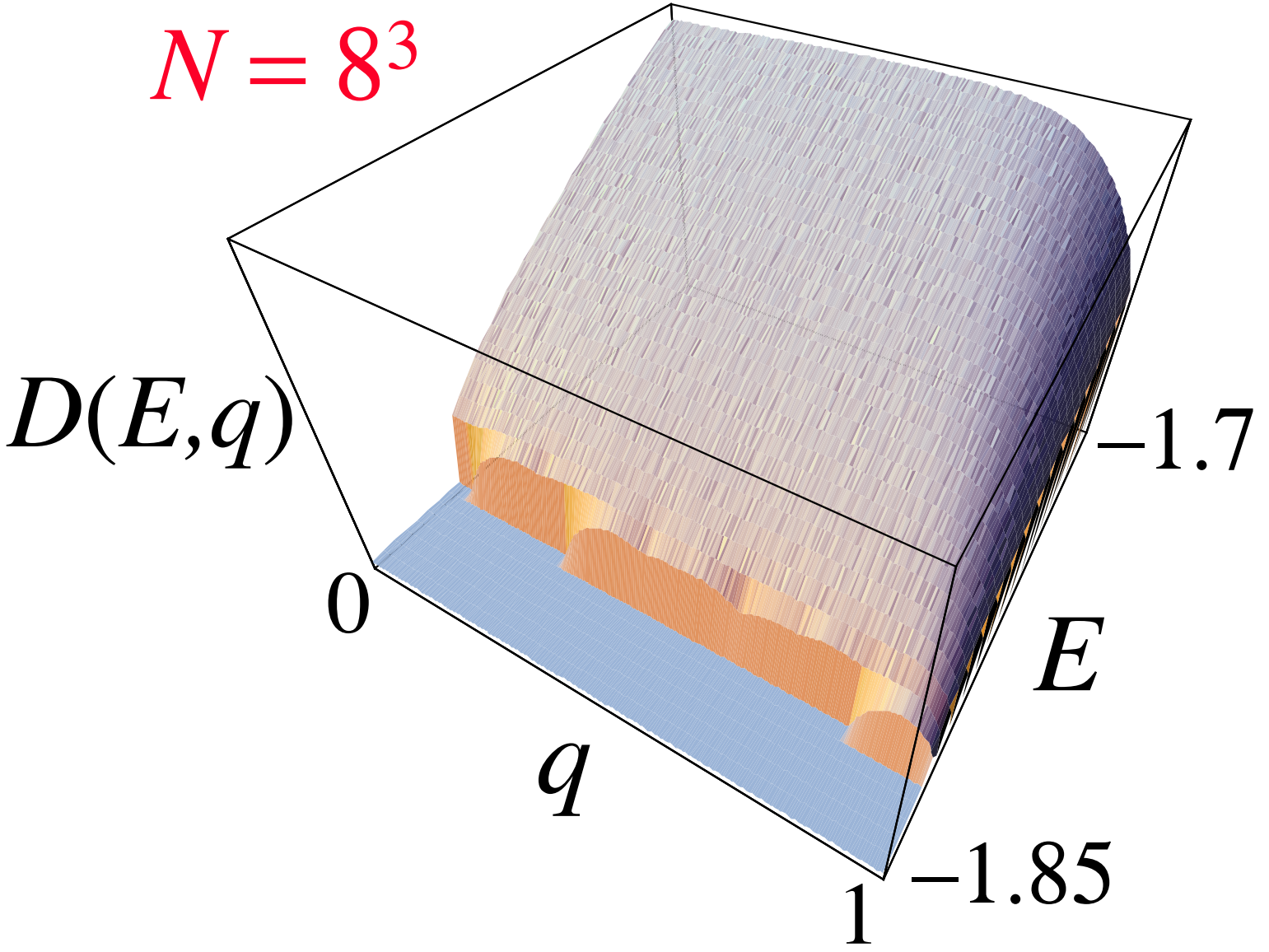


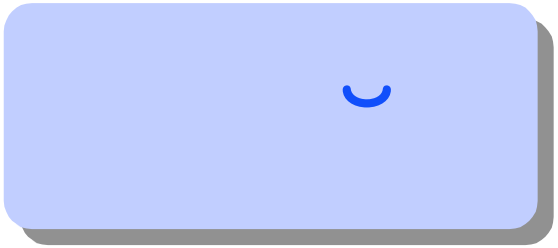
(*) Monovariate multicanonical
Berg & Janke, PRL**80**, 4771 ('98)

Œ ˇ } ' J m j J



æ ˇ § (E,q)





- æ ˇ } ‘ J m j J

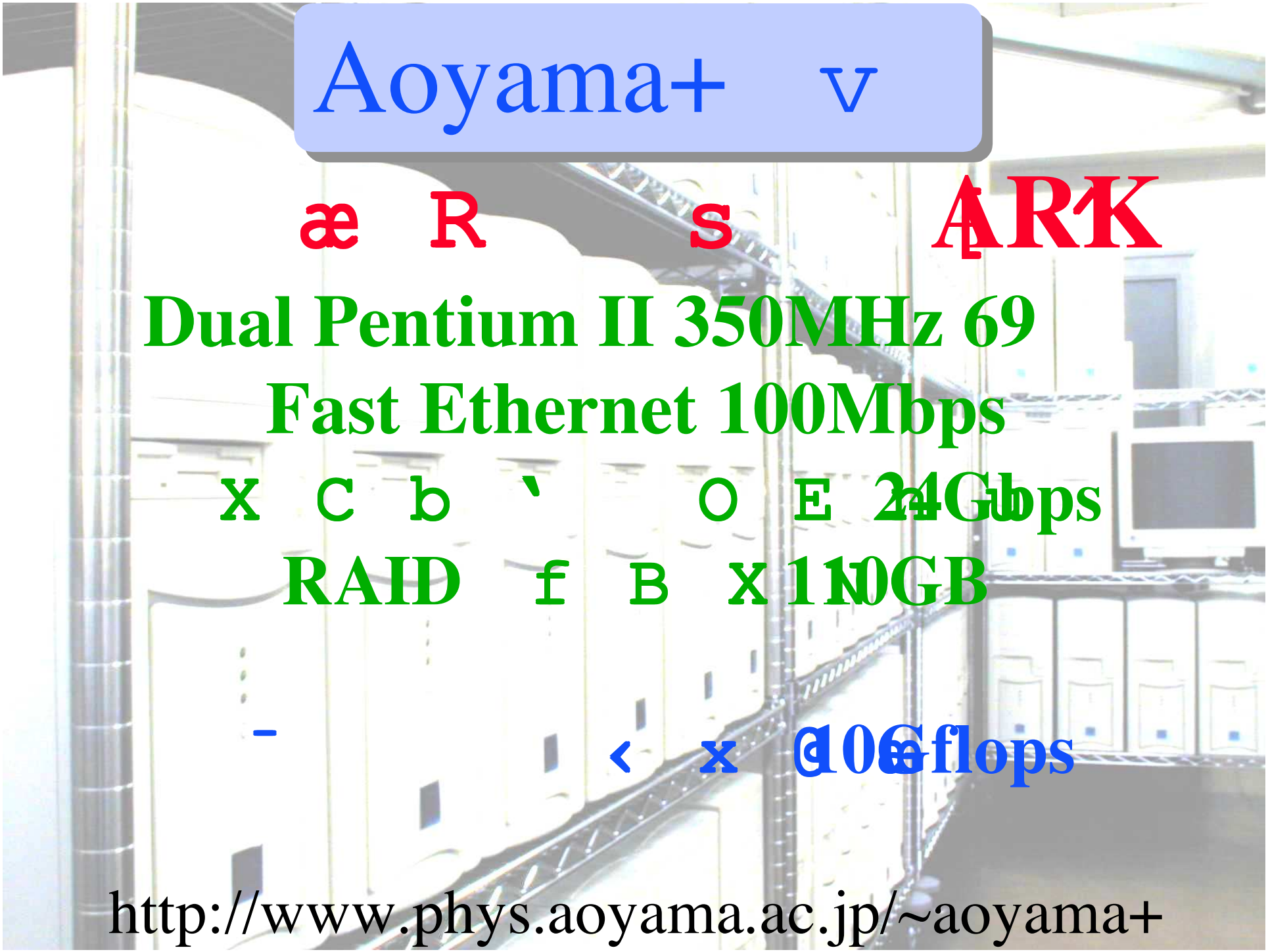
  @ @ @ @ @ e J

  @→ •: πN

- Æ • « ¿

  @→ $P(q; T{=}0.3)$ ″

  @ @ @ @ @ @ t H ‘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