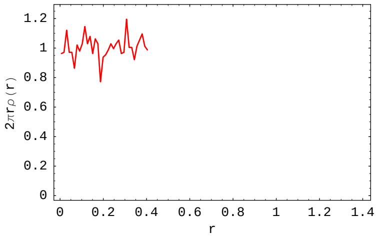
Elliptic Gaussian measures

Illustration



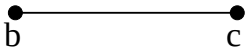
Feynman diagrams

- Convention (normalized trace) $g(z) = \frac{1}{N}\mathrm{Tr}\, G(z)$
- Geometric expansion

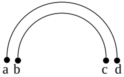
$$G(z) = \left\langle (Z - A)^{-1} \right\rangle = \langle Z^{-1} + Z^{-1} A\, Z^{-1} + Z^{-1} A\, Z^{-1} A\, Z^{-1} + \ldots \rangle$$

- Propagators

$$Z^{-1}_{bc}$$



$$\langle A_{ab} A_{cd} \rangle = \frac{1}{N} \delta_{ad} \delta_{bc}$$



Analogy to symmetry breaking

- For finite N there are isolat
- $\partial_{\bar{z}} g(z, \bar{z}) = 0$ almost ev
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Linearization

- Problem

$$G(z) = \left\langle (z - X_1 X_2 \dots X_M)^{-1} \right\rangle$$

- Related resolvent

$$G_Y(w) = \left\langle (w - Y)^{-1} \right\rangle$$

where

$$Y = \left(\right.$$