2d CFT

邹海涛
ID: 17210180015

Week 1

Exercies 0.0.1. By the homogeneous relation

$$f(t,h) = b^{-d} f(b^{y_t} t, b^{y_h} h)$$

we have

$$f(t,h) = t^{-\frac{d}{y_t}} g(\alpha)$$

where $g(\alpha) = f(1,\alpha)$ and $\alpha = t^{-\frac{y_h}{y_t}} h$. It is easy to see that α is invariance under scaling transformation $x \to x/b$. Hence we have

$$\begin{aligned}
C(t,0) &= -T\frac{\partial^2 f}{\partial T^2}\Big|_{h=0} = -\frac{1}{T_c} t^{\frac{d}{y_t}-2} g''(0) \\
M(t,0) &= -\frac{\partial f}{\partial B}\Big|_{h=0} = t^{\frac{d-y_h}{y_t}} g'(0) \\
\chi(t,0) &= \frac{\partial^2 f}{\partial B^2}\Big|_{h=0} = t^{(d-2y_h)/y_t} g''(0)
\end{aligned}$$

As function with single variable h, $\lim_{t\to 0} M(t,h) \sim h^{\frac{1}{\delta}} \sim \alpha^{\frac{1}{\delta}}$.