

(19)

2 The full effective action to two derivatives (bosons)  
and one derivative (fermions) is

$$\frac{|d\psi|^2}{|\Lambda\bar{\Lambda}|^2} = f_0 \ln \frac{f_0}{\Lambda\bar{\Lambda}} + V_{\text{eff}} =$$

$$= \frac{f_0^3}{|\Lambda\bar{\Lambda}|^2} \left\{ 2 \frac{\ln(1+x) - x}{x^2} + \frac{1}{2} \frac{1}{1+x} \right\} =$$

$$= \frac{\bar{\lambda}_R \not{D}_L \lambda_R + \bar{\lambda}_L \not{D}_R \lambda_L}{|\Lambda\bar{\Lambda}|^2} \frac{\ln(1+x) - x}{x^2} = 2 \frac{i\Lambda\bar{\Lambda} \not{\partial}_L \lambda_L + i\Lambda\bar{\Lambda} \not{\partial}_R \lambda_R}{|\Lambda\bar{\Lambda}|^2} \frac{1}{1+x}$$

$$+ 4 \frac{\bar{\lambda}_R \lambda_L \bar{\lambda}_L \lambda_R}{|\Lambda\bar{\Lambda}|^2} \left\{ \frac{\ln(1+x) - x}{x^2} + \frac{1}{1+x} \right\} +$$

$$+ \frac{1}{4} \ln |\Lambda\bar{\Lambda}|^2 \cdot \frac{(1-x^2) \ln(1+x) - x}{x^2} = 2 \frac{f_0^3 (i\Lambda\bar{\Lambda} \not{\partial}_L \lambda_L - i\Lambda\bar{\Lambda} \not{\partial}_R \lambda_R)}{|\Lambda\bar{\Lambda}|^4} \times$$

$$= \frac{\ln(1+x) - x}{x^2}$$

Where  $V_{\text{eff}} = -(|\Lambda\bar{\Lambda}|^2 + iD) \ln(|\Lambda\bar{\Lambda}|^2 + iD) + iD + |\Lambda\bar{\Lambda}|^2 \ln |\Lambda\bar{\Lambda}|^2$

$$x = \frac{iD}{|\Lambda\bar{\Lambda}|^2}$$

$$D_R = \not{\partial}_R - \not{\partial}_R \ln |\Lambda\bar{\Lambda}|$$

$$D_L = \not{\partial}_L - \not{\partial}_L \ln |\Lambda\bar{\Lambda}|$$