$$V = \frac{\lambda}{8}(\phi^2 - v^2)^2 + \lambda \Delta v^3 (\phi - v)$$

$$= \lambda v^4 \left[\frac{1}{8}(\varphi^2 - 1)^2 + \Delta(\varphi - 1)\right] = \lambda v^4 \tilde{V}$$

$$S_E = \Omega \int_0^\infty d\rho\, \rho^{D-1} \left[\frac{1}{2}\dot{\phi}^2 + V(\phi)\right]$$

$$\phi = v\varphi \qquad \boxed{\rho = \frac{1}{\sqrt{\lambda}\, v}(z + r)}$$

$$S_E = \Omega \frac{v^{4-D}}{\lambda^{D/2-1}} \int_{-r}^\infty dz\, (z+r)^{D-1} \left[\frac{1}{2}\varphi'^2 + \tilde{V}(\varphi)\right]$$

$$r = \frac{1}{\Delta} \sum_{n=0}^\infty r_n \Delta^n = \frac{r_0}{\Delta} + r_1 + r_2 \Delta + \cdots$$

$$\varphi = \varphi_0 + \Delta \varphi_1 + \Delta^2 \varphi_2 + \cdots$$

$$\varphi'' + \frac{D-1}{(z+r)} \varphi' = \frac{d\tilde{V}}{d\varphi} \qquad \varphi' \equiv \frac{d\varphi}{dz}$$

$$\varphi(z \to \infty) = \varphi_{FV}$$

$$\varphi_0'' = \frac{1}{4} 2\varphi_0(\varphi_0^2 - 1) \qquad \varphi'(z = -r \to -\infty) = 0$$

$$\phi(\rho \to \infty) = \phi_{FV}$$

$$\dot{\phi}(\rho = 0) = 0$$

$$\phi(\rho, \Omega) = \bar{\Phi}(\rho) + \psi(\rho, \Omega)$$

$$\nu = \ell + \frac{D}{2} - 1$$

(B.18): $\frac{d^2}{dz^2} \varphi_{VFV} = f(\Delta)$

$$\ln\left|\frac{\det' O}{\det O_{FV}}\right|^{-\frac{1}{2}} = \ln\left|\prod_{l=0}^{\infty}\frac{\det' O_l}{\det O_{lFV}}\right|^{-\frac{1}{2}}$$

$$-\frac{1}{2}\sum_{l=0}^{\infty}\ln\left[R_l^{d_l}(\rho\to\infty)\right] \qquad l > \frac{1}{\Delta}$$

(B.61) valid as long as $\Delta\nu \ll 1$

$$\psi_{\nu FV} = C_{FV}\,\mathrm{Exp}\left[z\left(1-\frac{3}{2}\Delta+\frac{1}{2}\frac{(\Delta\nu)^2}{r_0^2}+\frac{\Delta^2}{2}\left(-\frac{1}{4r_0^2}-\frac{21}{4}\right)\right)\right]$$

(5.12) $$\frac{d^2}{dz^2}\psi_{lFV} = \underbrace{\left(\frac{\Delta^2\nu^2-\frac{\Delta^2}{4}}{(r_0+\Delta z)^2}+1-3\Delta-3\Delta^2\right)}_{\left(\underbrace{1+\frac{\Delta^2\nu^2}{r_0^2}}_{K_\nu^2 = 1+\frac{\Delta^2\nu^2}{r_0^2}}+O(\Delta)\right)}\psi_{lFV}$$

$$r = \frac{r_0}{\Delta}$$

low l: $R_l(\rho\to\infty) = e^{\Delta^{-1}}\,\Delta^2\,(l-1)\frac{\cdots}{\cdots}$

generic l: $R_\nu(\rho\to\infty) = R_{\nu_0}(\rho\to\infty)\,e^{\nu}$