

$$\exp\left[S_P[U_{\mathbf{x}}]\right] = \int DU_0(\mathbf{x},0)DU_{\kappa}D\phi\left\{\prod_{\mathbf{x}}\delta[U_{\mathbf{x}}-U_0(\mathbf{x},0)]\right\}e^{S_L}$$