

Then, we have

$$Z = Z_0 Z_N \det_{\text{over}} = \frac{\det[D^{\text{Dyag}}]}{\det[D^{\text{Av}}]} = \det(D_N^{\text{ov}}).$$

The overlap operator is the only known solution to the Ginsparg-Wilson equation. In fact, one can obtain this from a purely 4D theory. To see this, we first take the

$N \rightarrow \infty$ limit of ~~the~~ D_N^{ov} summing

$$1 + \gamma_5 \tanh\left(\frac{N}{2}\tilde{H}\right) = 1 + \gamma_5 \tilde{\epsilon}(\tilde{H}) \xrightarrow{\text{summing}} 1 + \gamma_5 \frac{\tilde{H}}{\sqrt{H^* \tilde{H}}}$$

further upon taking the continuum limit in the γ_5 direction, one finds

$\tilde{H} = D_w - m \rightarrow$ the usual 4D Wilson operator, obtainable directly from the 4D theory. One must then study the partition function w.r.t. the overlap of two vacuum states at different mass. The fact that its also derivable from DWFs is an indication of the power of this formalism.

Conclusion in PCV .

Next week: FradC? \rightarrow finite temperature
or density.