

$$\begin{aligned}
R.N. \int_F d\mu \, \Gamma_{(d+k,d)} \, \mathcal{F}(s, \kappa, -\tfrac{k}{2}) &= \lim_{T \rightarrow \infty} \left[\int_{\mathcal{F}_T} d\mu \, \Gamma_{(d+k,d)} \, \mathcal{F}(s, \kappa, -\tfrac{k}{2}) + f_0(s) \frac{T^{\frac{d}{2} + \frac{k}{4}} - s}{s - \frac{d}{2} - \frac{k}{4}} \right] \\
&= \int_0^\infty d\tau_2 \, \tau_2^{d/2-2} \, \mathcal{M}_{s, -\frac{k}{2}}(-\kappa\tau_2) \sum_{\text{BPS}} e^{-\pi\tau_2 (P_L^2 + P_R^2)/2}
\end{aligned}$$