

$$\frac{-1}{\sqrt{1+\sqrt{1-\Gamma}}}\frac{\Gamma}{\sqrt{1-\Gamma}}\Theta = \frac{\Gamma}{\sqrt{1-\Gamma}}\frac{1/2}{D} e^{\pi i \frac{\Gamma}{\sqrt{1-\Gamma}} T} \frac{\Gamma}{\sqrt{1-\Gamma}}\Theta$$

$$\int_{d\Gamma}^{\mathbb{R}_d} -\Gamma \mathcal{E}^\Gamma -_1^2 \mathcal{E}^\Gamma = \frac{\pi^{d/2}}{\Gamma D^{1/2}} -\Gamma \mathcal{E}^\Gamma$$

$$\underbrace{\Gamma + \Gamma \bar{\Gamma}}_{\Gamma} \star \underbrace{\Gamma + \Gamma \bar{\Gamma}}_{\Gamma} \Gamma = \Gamma \star \Gamma \Gamma + 2\Gamma \star \Gamma + \underbrace{\Gamma \bar{\Gamma}}_{\Gamma} \star \Gamma$$

$$\Rightarrow \text{LHS} = -\Gamma \mathcal{E}^\Gamma \int_{d\Gamma}^{\mathbb{R}_d} -\Gamma \mathcal{E}^\Gamma + \Gamma \bar{\Gamma} \underset{\Gamma = \Gamma + \Gamma \bar{\Gamma}}{=} -\Gamma \mathcal{E}^\Gamma \int_{d\Gamma}^{\mathbb{R}_d} -\Gamma \mathcal{E}^\Gamma = \text{RHS}$$

$$\begin{array}{ccc} \Gamma & & \\ \curvearrowright & & \curvearrowleft \\ \Gamma \star \Gamma & \Gamma \in \Gamma \ni \Gamma & \Gamma \in \Gamma \nabla \mathbb{K} \ni \overset{*}{\Gamma} \Gamma \\ & \curvearrowleft & \curvearrowright \\ & \Gamma & \end{array}$$

$$\underbrace{\Gamma \overset{*}{\Gamma} \Gamma}_{\Gamma} = \Gamma : \overbrace{\Gamma \star \Gamma}^* = \Gamma$$

$$\mathbb{Z}_d \subset \Gamma : \Gamma \nabla \mathbb{K} \supset \widehat{2\pi i \mathbb{Z}}^d$$

$${}^T_z\mathbb{Z}^d = \frac{\pi^{d/2}}{{}^T\mathcal{D}^{1/2}} \mathcal{E}^{4\pi^2 z \bar{T}\mathbf{x} z} \frac{\bar{T}}{2z\bar{T}} \underline{2\pi i \mathbb{Z}}_d$$

$$\begin{aligned} \text{LHS} &= \sum_{\mathfrak{t}}^{\mathbb{Z}_d} \mathcal{E}^{-\mathfrak{t}\widehat{\mathfrak{t}} + \mathfrak{t}\lfloor 2\pi i} = \sum_{\mathfrak{t}}^{\widehat{2\pi i \mathbb{Z}}} \int_{d\Gamma}^{\mathbb{R}_d} \mathcal{E}^{-\Gamma \mathfrak{t}} \mathcal{E}^{-\Gamma \widehat{\mathfrak{t}}} + \Gamma \lfloor 2\pi i = \sum_{\mathfrak{t}}^{\widehat{2\pi i \mathbb{Z}}} \int_{d\Gamma}^{\mathbb{R}_d} \mathcal{E}^{-\Gamma \widehat{\mathfrak{t}}} \mathcal{E}^{\Gamma \lfloor 2\pi i - \mathfrak{t}} \\ &= \frac{\pi^{d/2}}{{}^T\mathcal{D}^{1/2}} \sum_{\mathfrak{t}}^{\widehat{2\pi i \mathbb{Z}}} \mathcal{E}^{\left(\widehat{\mathfrak{t}} + \Gamma \lfloor 2\pi i\right) \left(\widehat{\mathfrak{t}} + \Gamma \lfloor 2\pi i\right)} \bar{\Gamma} \\ &= \sum_n^{\mathbb{Z}^d} \mathcal{E}^{-n T \mathbf{x} n + 2\pi i z \mathbf{x} n} = \sum_{\nu}^{\widehat{2\pi i \mathbb{Z}}} \int_{dy}^{\mathbb{R}^d} \mathcal{E}^{-y\nu} \mathcal{E}^{-y T \mathbf{x} y + 2\pi i z \mathbf{x} y} \\ &= \sum_{\nu}^{\widehat{2\pi i \mathbb{Z}}} \int_{dy}^{\mathbb{R}^d} \mathcal{E}^{-y T \mathbf{x} y} \mathcal{E}^{-y \mathbf{x} (\nu + 2\pi i z)} = \frac{\pi^{d/2}}{{}^T\mathcal{D}^{1/2}} \sum_{\nu}^{\widehat{2\pi i \mathbb{Z}}} \mathcal{E}^{-(\nu + 2\pi i z) \bar{T} \mathbf{x} (\nu + 2\pi i z)} \\ &= \frac{\pi^{d/2}}{{}^T\mathcal{D}^{1/2}} \mathcal{E}^{4\pi^2 z \bar{T} \mathbf{x} z} \sum_{\nu}^{\widehat{2\pi i \mathbb{Z}}} \mathcal{E}^{-\nu \bar{T} \mathbf{x} \nu - 4\pi i z \bar{T} \mathbf{x} \nu} = \text{RHS} \end{aligned}$$

$$\begin{matrix} {}^{-1} \Theta = {}^{\mathfrak{r}} \mathcal{D}^{1/2} \mathcal{E}^{\pi i \Gamma^{-1} \mathfrak{T}} {}^{\mathfrak{r}} \Theta \end{matrix}$$

$$\overbrace{\Gamma + \overbrace{\Gamma}^* \Gamma}^* \overbrace{\Gamma + \overbrace{\Gamma}^* \Gamma}^* \Gamma$$