$$⌊ ⋈ \mathbb{R}^{\overset{2}{⊳}_{\infty}} \mathbb{C}$$

$$\overline{()} \Big\downarrow \text{quant /Geod}_{1\text{-}\alpha}\text{/ Toep / Weyl}$$

$$⌊\, {}^{2}_{\omega}\!⊳ \overset{\nu}{\mathbb{C}}\ \overset{2}{\underset{0}{⊲}}\ \overbrace{⌊\, {}^{2}_{\omega}\!⊳ \overset{\nu}{\mathbb{C}}} = ⌊\, {}^{2}_{\omega}\!⊳ \overset{\nu}{\mathbb{C}} ⋈ \overbrace{⌊\, {}^{2}_{\omega}\!⊳ \overset{\nu}{\mathbb{C}}}^{\sharp}$$

$$s_0^\alpha z = \alpha z$$

$$s_w^\alpha z = s_{g_w 0}^\alpha z = g_w\, s_0^\alpha\, g_w^{-1} z = w + \alpha\,(z - w) = \alpha z + (1-\alpha)\, w$$

$${}^{z}\overbrace{⌐⌋ ⌉} = \nu \int_{d^2 w/\pi}^{\mathbb{C}} {}^{\nu\,(1-\alpha)\,(z-w)\,\bar{w}} e\ {}_{w}⌋^{\ \alpha z + (1-\alpha)\,w} ⌉$$

$$⌐⌋ = \nu \int_{d^2 w/\pi}^{\mathbb{C}} {}_{w}⌋\, \overline{w}$$

$$\alpha = 0 \Longrightarrow \text{ Toeplitz } {}^{z}\overbrace{⌐⌋ ⌉} = \nu \int_{d^2 w/\pi}^{\mathbb{C}} {}^{\nu\,(z-w)\,\bar{w}} e\ {}_{w}⌋^{\ w} ⌉ = \nu \int_{d^2 w/\pi}^{\mathbb{C}} {}^{-\nu w \bar{w}} e\ {}^{\nu z \bar{w}} e\ {}_{w}⌋^{\ w} ⌉$$

$$\alpha = -1 \Longrightarrow \text{ Weyl } {}^{z}\overbrace{⌐⌋ ⌉} = \nu \int_{d^2 w/\pi}^{\mathbb{C}} {}^{2\nu\,(z-w)\,\bar{w}} e\ {}_{w}⌋^{\ 2w - z} ⌉$$

$$\widehat{\nu\alpha}^{d} \int_{dx/\pi^{d}}^{\mathbb{C}^{d}} \overset{1\text{-}\alpha}{\ulcorner x} \underset{\text{normalize}}{=} I$$

$$\widehat{\nu\alpha}^{d} \int_{dx/\pi^{d}}^{\mathbb{C}^{d}} {}^{z}\overbrace{\overset{1\text{-}\alpha}{\ulcorner x}}\rceil = \widehat{\nu\alpha}^{d} \int_{dx/\pi^{d}}^{\mathbb{C}^{d}} {}^{(1-\alpha)\,z+\alpha x}\rceil \; {}^{z}\mathcal{E}_{x}^{\nu\alpha} \; {}^{x}\mathcal{E}_{x}^{-\nu\alpha} = \int_{dx/\pi^{d}}^{\mathbb{C}^{d}} \frac{\widehat{\nu\alpha}^{d}}{{}^{x}\mathcal{E}_{x}^{\nu\alpha}} \, {}^{z}\mathcal{E}_{x}^{\nu\alpha} \; {}^{(1-\alpha)\,z+\alpha x}\rceil = {}^{(1-\alpha)\,z+\alpha z}\rceil = {}^{z}\rceil$$

$$\overset{1\text{-}\alpha}{\ulcorner \mathsf{J}} = \overset{d}{\widehat{\nu\alpha}} \int_{dw/\pi^{d}}^{{}^{d}\mathbb{C}} {}_{w}\mathsf{J} \; \overset{1\text{-}\alpha}{\ulcorner w}$$

$$ {}^{z}\overbrace{\overset{1\text{-}\alpha}{\ulcorner \mathsf{J}}}\rceil = \int_{dw/\pi^{d}}^{{}^{d}\mathbb{C}} \frac{(\nu\alpha)^{d}}{{}^{w}e_{w}^{\nu\alpha}} \, {}^{z}\mathcal{E}_{w}^{\nu\alpha} \; {}_{w}\mathsf{J} \; {}^{(1-\alpha)\,z+\alpha w}\rceil \underset{\text{Weyl}}{\overset{\text{Toep}}{=}} \begin{cases} \int_{dw/\pi^{d}}^{{}^{d}\mathbb{C}} \frac{\nu^{d}}{{}^{w}e_{w}^{\nu}} \, {}^{z}\mathcal{E}_{w\,w}^{\nu}\mathsf{J}^{w}\rceil & \alpha = 1 \\ \int_{dw/\pi^{d}}^{{}^{d}\mathbb{C}} \frac{(2\nu)^{d}}{{}^{w}e_{w}^{2\nu}} \, {}^{z}\mathcal{E}_{w\,w}^{2\nu}\mathsf{J}^{2w-z}\rceil & \alpha = 2 \end{cases}$$

$$ {}_{z}\underbrace{\mathsf{J} \neq \bar{\mathsf{J}}} \underset{\text{Weyl}}{=} = \left(\frac{2\nu}{\pi}\right)^{d} \int_{dx}^{\mathbb{C}_{d}} {}_{x}\mathsf{J} \int_{dy}^{\mathbb{C}_{d}} {}_{y}\bar{\mathsf{J}} \; \underbrace{{}^{x|y|z}_{2\nu}\boxed{\mathcal{E}}^{\begin{array}{c|c|c} 0 & 1 & -1 \\ \hline -1 & 0 & 1 \\ \hline 1 & -1 & 0 \end{array}}_{x|y|z}}_{= {}^{z-x}_{2\nu}\mathcal{E}_{z-y} \; {}^{z-y}_{2\nu}\mathcal{E}^{-1}_{z-x}}$$

$$ {}_{\zeta}\underbrace{\mathsf{J}\sharp\bar{\mathsf{J}}} \; \underset{\text{Up}}{\overset{\text{Ar}}{=}} \left(\frac{\nu\,(1-\alpha)\,(1-\beta)\,(1-\gamma)}{2\pi\,(\alpha\beta-\gamma)}\right)^{d} \int_{d\xi}^{\mathbb{C}_{d}} {}_{\xi}\mathsf{J} \int_{d\eta}^{\mathbb{C}_{d}} {}_{\eta}\bar{\mathsf{J}} \; \underbrace{{}^{\xi|\eta|\zeta}_{2\nu}\boxed{\mathcal{E}}^{\begin{array}{c|c|c} -a & -b & a+b \\ \hline -c & -d & c+d \\ \hline a+c & b+d & -a-b-c-d \end{array}}_{\xi|\eta|\zeta}}_{= {}^{\zeta-\xi}_{2\nu}\mathcal{E}^{a}_{\zeta-\xi} \; {}^{\zeta-\xi}_{2\nu}\mathcal{E}^{b}_{\zeta-\eta} \; {}^{\zeta-\eta}_{2\nu}\mathcal{E}^{c}_{\zeta-\xi} \; {}^{\zeta-\eta}_{2\nu}\mathcal{E}^{d}_{\zeta-\eta}}$$

$$
{}_{z}\underbrace{\overbrace{e_\alpha \bowtie \mathsf{J}} \neq \overbrace{e_\beta \bowtie \mathsf{J}}} = \left(\frac{\nu\,(1-\alpha)\,(1-\beta)}{\pi\,(1+\alpha\beta)}\right)^{d} \int_{d\xi}^{\mathbb{C}_d} {}_{\xi}\mathsf{J} \int_{d\eta}^{\mathbb{C}_d} {}_{\eta}\mathsf{J} \;{}^{\xi|\eta|z}_{\nu/1+\alpha\beta}\boxed{\mathcal{E}}^{\begin{array}{c|c|c} -(1-\alpha)(1+\beta) & (1-\alpha)(1-\beta) & 2(1-\alpha)\beta \\ \hline -(1-\alpha)(1-\beta) & -(1+\alpha)(1-\beta) & 2(1-\beta) \\ \hline 2(1-\alpha) & 2\alpha(1-\beta) & -2(1-\alpha\beta) \end{array}}_{\xi|\eta|z}
$$

$$
\text{LHS} = \left(\frac{2\nu}{\pi}\right)^{d} \int_{dx}^{\mathbb{C}_d} {}_{x}\underbrace{e_\alpha \bowtie \mathsf{J}} \int_{dy}^{\mathbb{C}_d} {}_{y}\underbrace{e_\beta \bowtie \mathsf{J}} \;{}^{x|y|z}_{2\nu}\boxed{\mathcal{E}}^{\begin{array}{c|c|c} 0 & 1 & -1 \\ \hline -1 & 0 & 1 \\ \hline 1 & -1 & 0 \end{array}}_{x|y|z}
$$

$$
= \underbrace{\left(\frac{2\nu}{\pi}\right)^{d} \int_{d\xi}^{\mathbb{C}_d} {}_{\xi}\mathsf{J} \int_{d\eta}^{\mathbb{C}_d} {}_{\eta}\mathsf{J}}_{=\,*} \left(\frac{2\nu\widetilde{\alpha}}{\pi}\right)^{d} \left(\frac{2\nu\widetilde{\beta}}{\pi}\right)^{d} \int_{dx}^{\mathbb{C}_d}\int_{dy}^{\mathbb{C}_d} {}^{x-\xi}_{2\nu}\mathcal{E}^{-\widetilde{\alpha}}_{x-\xi}\; {}^{y-\eta}_{2\nu}\mathcal{E}^{-\widetilde{\beta}}_{y-\eta}\; {}^{x|y|z}_{2\nu}\boxed{\mathcal{E}}^{\begin{array}{c|c|c} 0 & 1 & -1 \\ \hline -1 & 0 & 1 \\ \hline 1 & -1 & 0 \end{array}}_{x|y|z}
$$

$$
= * \left(\widetilde{\alpha}\widetilde{\beta}\right)^{d} {}^{\xi}_{2\nu}\mathcal{E}^{-\widetilde{\alpha}}_{\xi}\; {}^{\eta}_{2\nu}\mathcal{E}^{-\widetilde{\beta}}_{\eta} \left(\frac{2\nu}{\pi}\right)^{2d} \int_{dx}^{\mathbb{C}_d}\int_{dy}^{\mathbb{C}_d} {}^{x|y}_{-2\nu}\boxed{\mathcal{E}}^{\begin{array}{c|c} \widetilde{\alpha} & -1 \\ \hline 1 & \widetilde{\beta} \end{array}}_{x|y}\; {}^{\bar{\xi}|\bar{\eta}|\bar{z}}_{2\nu}\boxed{\mathcal{E}}^{\begin{array}{c|c} \widetilde{\alpha} & 0 \\ \hline 0 & \widetilde{\beta} \\ \hline -1 & 1 \end{array}}_{\bar{x}|\bar{y}}\; {}^{\xi|\eta|z}_{2\nu}\boxed{\mathcal{E}}^{\begin{array}{c|c} \widetilde{\alpha} & 0 \\ \hline 0 & \widetilde{\beta} \\ \hline 1 & -1 \end{array}}_{x|y}
$$

$$
\underset{\text{Gauss}}{=} * \left(\widetilde{\alpha}\widetilde{\beta}\right)^{d} {}^{\xi}_{2\nu}\mathcal{E}^{-\widetilde{\alpha}}_{\xi}\; {}^{\eta}_{2\nu}\mathcal{E}^{-\widetilde{\beta}}_{\eta} \underbrace{\overbrace{\begin{array}{c|c} \widetilde{\alpha} & -1 \\ \hline 1 & \widetilde{\beta} \end{array}}^{-1}}_{=\left(1+\widetilde{\alpha}\widetilde{\beta}\right)^{d}} {}^{\xi|\eta|z}_{2\nu}\boxed{\mathcal{E}}^{\begin{array}{c|c} \widetilde{\alpha} & 0 \\ \hline 0 & \widetilde{\beta} \\ \hline 1 & -1 \end{array}\begin{array}{c|c} \widetilde{\alpha} & -1 \\ \hline 1 & \widetilde{\beta} \end{array}^{-1}\begin{array}{c|c|c} \widetilde{\alpha} & 0 & -1 \\ \hline 0 & \widetilde{\beta} & 1 \end{array}}_{\xi|\eta|z}
$$

$$
= * \left(\frac{\widetilde{\alpha}\widetilde{\beta}}{1+\widetilde{\alpha}\widetilde{\beta}}\right)^{d} {}^{\xi|\eta|z}_{2\nu/1+\widetilde{\alpha}\widetilde{\beta}}\boxed{\mathcal{E}}^{\begin{array}{c|c|c} \widetilde{\alpha}^2\widetilde{\beta} - \widetilde{\alpha}\left(1+\widetilde{\alpha}\widetilde{\beta}\right) & \widetilde{\alpha}\widetilde{\beta} & \widetilde{\alpha}\left(1-\widetilde{\beta}\right) \\ \hline -\widetilde{\alpha}\widetilde{\beta} & \widetilde{\alpha}\widetilde{\beta}^2 - \widetilde{\beta}\left(1+\widetilde{\alpha}\widetilde{\beta}\right) & (1+\widetilde{\alpha})\,\widetilde{\beta} \\ \hline \widetilde{\alpha}\left(1+\widetilde{\beta}\right) & (1-\widetilde{\alpha})\,\widetilde{\beta} & -\widetilde{\alpha}-\widetilde{\beta} \end{array}}_{\xi|\eta|z} = \text{RHS}
$$

$$
\begin{array}{c|c} \widetilde{\alpha} & -1 \\ \hline 1 & \widetilde{\beta} \end{array}^{-1} = \frac{1}{1+\widetilde{\alpha}\widetilde{\beta}}\begin{array}{c|c} \widetilde{\beta} & 1 \\ \hline -1 & \widetilde{\alpha} \end{array} : \quad 1 + \widetilde{\alpha}\,\widetilde{\beta} = \frac{2\,(1+\alpha\beta)}{(1+\alpha)\,(1+\beta)}
$$

$$N = \widetilde{\gamma} + a + b + c + d$$

$${}_{z}\underbrace{e_{\gamma} \bowtie \overbrace{\mathsf{J}\sharp\mathsf{Ɉ}}} = \left(\frac{\nu(1-\alpha)(1-\beta)(1-\gamma)\widetilde{\gamma}}{2\pi(\alpha\beta-\gamma)N}\right)^{d} \int_{d\xi}^{\mathbb{C}_d} {}_{\xi}\mathsf{J} \int_{d\eta}^{\mathbb{C}_d} {}_{\eta}\mathsf{Ɉ} \; {}^{\xi|\eta|z}_{2\nu/N}\boxed{\mathcal{E}}^{\begin{array}{c|c|c} bc-ad-\widetilde{\gamma}a & ad-bc-\widetilde{\gamma}b & (a+b)\widetilde{\gamma} \\ \hline ad-bc-\widetilde{\gamma}c & bc-ad-\widetilde{\gamma}d & (c+d)\widetilde{\gamma} \\ \hline \widetilde{\gamma}(a+c) & \widetilde{\gamma}(b+d) & -\widetilde{\gamma}(a+b+c+d) \end{array}}_{\xi|\eta|z}$$

$$\text{LHS} = \int_{\mathbb{C}^d}^{d\zeta} {}_{z-\zeta}e_{\gamma} \; {}_{\zeta}\underbrace{\mathsf{J}\sharp\mathsf{Ɉ}} = C \int_{\mathbb{C}^d}^{d\zeta} {}_{z-\zeta}e_{\gamma} \int_{d\xi}^{\mathbb{C}_d} {}_{\xi}\mathsf{J} \int_{d\eta}^{\mathbb{C}_d} {}_{\eta}\mathsf{Ɉ} \; {}^{\xi|\eta|\zeta}_{2\nu}\boxed{\mathcal{E}}^{\begin{array}{c|c|c} -a & -b & a+b \\ \hline -c & -d & c+d \\ \hline a+c & b+d & -a-b-c-d \end{array}}_{\xi|\eta|\zeta}$$

$$= \underbrace{C \int_{d\xi}^{\mathbb{C}_d} {}_{\xi}\mathsf{J} \int_{d\eta}^{\mathbb{C}_d} {}_{\eta}\mathsf{Ɉ}}_{=*} \left(\frac{2\nu\widetilde{\gamma}}{\pi}\right)^{d} \int_{\mathbb{C}^d}^{d\zeta} {}^{z-\zeta}_{2\nu}\mathcal{E}^{-\widetilde{\gamma}}_{z-\zeta} \; {}^{\xi|\eta|\zeta}_{2\nu}\boxed{\mathcal{E}}^{\begin{array}{c|c|c} -a & -b & a+b \\ \hline -c & -d & c+d \\ \hline a+c & b+d & -a-b-c-d \end{array}}_{\xi|\eta|\zeta}$$

$$= * \, \widetilde{\gamma}^{d} \; {}^{z}_{2\nu}\mathcal{E}^{-\widetilde{\gamma}}_{z} \; {}^{\xi|\eta}_{-2\nu}\boxed{\mathcal{E}}^{\begin{array}{c|c} a & b \\ \hline c & d \end{array}}_{\xi|\eta} \left(\frac{2\nu}{\pi}\right)^{d} \int_{\mathbb{C}^d}^{d\zeta} {}^{\zeta}_{2\nu}\mathcal{E}^{-a-b-c-d-\widetilde{\gamma}}_{\zeta} \; {}^{\bar{\xi}|\bar{\eta}|\bar{z}}_{2\nu}\boxed{\mathcal{E}}^{\begin{array}{c} a+c \\ \hline b+d \\ \hline \widetilde{\gamma} \end{array}}_{\bar{\zeta}} \; {}^{\xi|\eta|z}_{2\nu}\boxed{\mathcal{E}}^{\begin{array}{c} a+b \\ \hline c+d \\ \hline \widetilde{\gamma} \end{array}}_{\zeta}$$

$$\overset{\text{Gauss}}{=} * \, \widetilde{\gamma}^{d} N^{-d} \; {}^{z}_{2\nu}\mathcal{E}^{-\widetilde{\gamma}}_{z} \; {}^{\xi|\eta}_{-2\nu}\boxed{\mathcal{E}}^{\begin{array}{c|c} a & b \\ \hline c & d \end{array}}_{\xi|\eta} \; {}^{\xi|\eta|z}_{2\nu/N}\boxed{\mathcal{E}}^{\begin{array}{c} a+b \\ \hline c+d \\ \hline \widetilde{\gamma} \end{array}}_{\xi|\eta|z} \; a+c \mid b+d \mid \widetilde{\gamma}$$

$$= * \left(\frac{\widetilde{\gamma}}{N}\right)^{d} \; {}^{\xi|\eta|z}_{2\nu/N}\boxed{\mathcal{E}}^{\begin{array}{c|c|c} (a+b)(a+c)-aN & (a+b)(b+d)-bN & (a+b)\widetilde{\gamma} \\ \hline (c+d)(a+c)-cN & (c+d)(b+d)-dN & (c+d)\widetilde{\gamma} \\ \hline \widetilde{\gamma}(a+c) & \widetilde{\gamma}(b+d) & \widetilde{\gamma}^{2}-\widetilde{\gamma}N \end{array}}_{\xi|\eta|z} = \text{RHS}$$

$$\underbrace{e_\alpha \bowtie \mathsf{J}} \neq \underbrace{e_\beta \bowtie \mathsf{Ɉ}} = e_\gamma \bowtie \underbrace{\mathsf{J} \sharp \mathsf{Ɉ}}$$

$$2\left(\alpha\beta-\gamma\right)\frac{a \mid b}{c \mid d} = \frac{\left(1-\alpha\right)\left(\beta-\gamma\right) \mid \left(1-\alpha\right)\left(1-\beta\right)\gamma}{\left(1-\alpha\right)\left(1-\beta\right) \mid \left(\alpha-\gamma\right)\left(1-\beta\right)}$$

$$\frac{2\left(\alpha\beta-\gamma\right)}{1-\gamma}\left(a+b+c+d\right) = 1-\alpha\beta$$

$$2\left(\alpha\beta-\gamma\right)N = 2\left(\alpha\beta-\gamma\right)\left(a+b+c+d+\widetilde{\gamma}\right) = \frac{\left(1-\gamma\right)^2\left(1+\alpha\beta\right)}{1+\gamma} = \widetilde{\gamma}\left(1-\gamma\right)\left(1+\alpha\beta\right)$$

$$1+\widetilde{\alpha}\,\widetilde{\beta} = \frac{2\left(1+\alpha\beta\right)}{\left(1+\alpha\right)\left(1+\beta\right)} \Longrightarrow \frac{4\left(\alpha\beta-\gamma\right)}{\widetilde{\gamma}}\frac{N}{1+\widetilde{\alpha}\widetilde{\beta}} = \left(1+\alpha\right)\left(1+\beta\right)\left(1-\gamma\right)$$

$$4\left(\alpha\beta-\gamma\right)\left(ad-bc\right) = \left(1-\alpha\right)\left(1-\beta\right)\left(1-\gamma\right) \Longrightarrow \frac{4\left(\alpha\beta-\gamma\right)}{\widetilde{\gamma}}\left(ad-bc\right) = \left(1-\alpha\right)\left(1-\beta\right)\left(1+\gamma\right)$$

$$\frac{4\left(\alpha\beta-\gamma\right)}{\widetilde{\gamma}}\frac{bc-ad-\widetilde{\gamma}a \mid ad-bc-\widetilde{\gamma}b}{ad-bc-\widetilde{\gamma}c \mid bc-ad-\widetilde{\gamma}d} = \underset{=\frac{4\left(\alpha\beta-\gamma\right)}{\widetilde{\gamma}}\frac{N/2}{1+\alpha\beta}}{\left(1-\gamma\right)}\frac{-\left(1-\alpha\right)\left(1+\beta\right) \mid \left(1-\alpha\right)\left(1-\beta\right)}{-\left(1-\alpha\right)\left(1-\beta\right) \mid -\left(1+\alpha\right)\left(1-\beta\right)} \Longrightarrow$$

$$\begin{array}{c|c|c} bc-ad-\widetilde{\gamma}a & ad-bc-\widetilde{\gamma}b & \left(a+b\right)\widetilde{\gamma} \\ \hline ad-bc-\widetilde{\gamma}c & bc-ad-\widetilde{\gamma}d & \left(c+d\right)\widetilde{\gamma} \\ \hline \widetilde{\gamma}\left(a+c\right) & \widetilde{\gamma}\left(b+d\right) & -\widetilde{\gamma}\left(a+b+c+d\right) \end{array} = \frac{N/2}{1+\alpha\beta}\begin{array}{c|c|c} -\left(1-\alpha\right)\left(1+\beta\right) & \left(1-\alpha\right)\left(1-\beta\right) & 2\left(1-\alpha\right)\beta \\ \hline -\left(1-\alpha\right)\left(1-\beta\right) & -\left(1+\alpha\right)\left(1-\beta\right) & 2\left(1-\beta\right) \\ \hline 2\left(1-\alpha\right) & 2\alpha\left(1-\beta\right) & -2\left(1-\alpha\beta\right) \end{array}$$

$$\left(\frac{\overset{d}{2\nu}}{\pi}\right)\left(\frac{\overset{d}{\widetilde{\alpha}\widetilde{\beta}}}{1+\widetilde{\alpha}\widetilde{\beta}}\right) = \left(\frac{\nu\left(1-\alpha\right)\left(1\overset{d}{-}\beta\right)\left(1-\gamma\right)\widetilde{\gamma}}{2\pi\left(\alpha\beta-\gamma\right)N}\right) \Longrightarrow {}_z\mathrm{LHS} = {}_z\mathrm{RHS}$$

$$\underbrace{\mathfrak{t}_\xi^\nu ⅂} \underset{\nu}{\bar{\wedge}} \underbrace{\overset{1\text{-}\alpha}{\zeta}\, \mathfrak{t}_\eta^\nu \gimel} = \nu^d \int\limits_{dz/\pi^d}^{\mathbb{C}^d} {}^z\mathcal{E}_z^{-\nu}\, {}^z\overline{\mathfrak{t}_\xi^\nu ⅂}\; {}^z\overbrace{\overset{1\text{-}\alpha}{\zeta}\, \mathfrak{t}_\eta^\nu \gimel} = \nu^d \int\limits_{dz/\pi^d}^{\mathbb{C}^d} {}^z\mathcal{E}_z^{-\nu}\, {}^{z+\xi}\bar{⅂}\, {}^\xi\mathcal{E}_z^{-\nu}\, {}^\xi\mathcal{E}_\xi^{-\nu/2}\, {}^{(1-\alpha)z+\alpha\zeta}\overbrace{\mathfrak{t}_\eta^\nu \gimel}\, {}^z\mathcal{E}_\zeta^{\nu\alpha}\, {}^z\mathcal{E}_z^{-\nu\alpha}$$

$$= \nu^d \int\limits_{dz/\pi^d}^{\mathbb{C}^d} {}^z\mathcal{E}_z^{\nu(-1-\alpha)}\, {}^{z+\xi}\bar{⅂}\, {}^\xi\mathcal{E}_z^{-\nu}\, {}^\xi\mathcal{E}_\xi^{-\nu/2}\, {}^{(1-\alpha)z+\alpha\zeta+\eta}\gimel\, {}^{(1-\alpha)z+\alpha\zeta}\mathcal{E}_\eta^{-\nu}\, {}^\eta\mathcal{E}_\eta^{-\nu/2}\, {}^z\mathcal{E}_\zeta^{\nu\alpha}$$

$$\underset{w=z+\xi}{=} \nu^d \int\limits_{dw/\pi^d}^{\mathbb{C}^d} {}^{w-\xi}\mathcal{E}_{w-\xi}^{\nu(-1-\alpha)}\, {}^w\bar{⅂}\, {}^\xi\mathcal{E}_{w-\xi}^{-\nu}\, {}^\xi\mathcal{E}_\xi^{-\nu/2}\, {}^{(1-\alpha)(w-\xi)+\alpha\zeta+\eta}\gimel\, {}^{(1-\alpha)(w-\xi)+\alpha\zeta}\mathcal{E}_\eta^{-\nu}\, {}^\eta\mathcal{E}_\eta^{-\nu/2}\, {}^{w-\xi}\mathcal{E}_\zeta^{\nu\alpha}$$

$$⅂ \underset{\nu}{\bar{\wedge}} \underbrace{\overset{1\text{-}\alpha}{\vartheta}\, \gimel} = \nu^d \int\limits_{dw/\pi^d}^{\mathbb{C}^d} {}^w\mathcal{E}_w^{\nu(-1-\alpha)}\, {}^w\bar{⅂}\, {}^{\alpha w+\alpha\vartheta}\gimel\, {}^w\mathcal{E}_\vartheta^{\nu\alpha}$$

$$\vartheta = \zeta + \frac{\eta - \alpha\xi}{1-\alpha}$$

$$x \mid y \mid z \;\begin{array}{c|c|c|c} a & b & -a-b & \bar{x} \\ \hline c & d & -c-d & \bar{y} \\ \hline -a-c & -b-d & a+b+c+d & \bar{z} \end{array} = \; x-z \mid y-z \;\begin{array}{c|c c} a & b & \bar{x}-\bar{z} \\ \hline c & d & \bar{y}-\bar{z} \end{array}$$

$$_z\underbrace{f\sharp g} = {}_xf\; {}_yg\; {}^{x-z}\mathcal{E}_{x-z}^a\; {}^{x-z}\mathcal{E}_{y-z}^b\; {}^{y-z}\mathcal{E}_{x-z}^c\; {}^{y-z}\mathcal{E}_{y-z}^d$$

$$= {}^x\mathcal{E}_z^{-a-b}\, {}^z\mathcal{E}_x^{-a-c}\, {}^z\mathcal{E}_z^{a+b+c+d}\, {}^x\mathcal{E}_y^b\, {}^z\mathcal{E}_y^{-b-d}\, {}^y\mathcal{E}_x^c\, {}^y\mathcal{E}_z^{-c-d}\, {}^x\mathcal{E}_x^a\, {}_xf\, {}^y\mathcal{E}_y^d\, {}_yg$$

$$\overline{f\sharp g}^{\zeta} = {}^\zeta\mathcal{E}_z\, {}^z\mathcal{E}_\zeta^{-1}\; {}_z\underbrace{f\sharp g} = {}^\zeta\mathcal{E}_z\, {}^z\mathcal{E}_\zeta^{-1}\, {}^x\mathcal{E}_z^{-a-b}\, {}^z\mathcal{E}_x^{-a-c}\, {}^z\mathcal{E}_z^{a+b+c+d}\, {}^x\mathcal{E}_y^b\, {}^z\mathcal{E}_y^{-b-d}\, {}^y\mathcal{E}_x^c\, {}^y\mathcal{E}_z^{-c-d}\, {}^x\mathcal{E}_x^a\, {}^y\mathcal{E}_y^d\, {}_xf\, {}_yg$$

$$\overset{1\text{-}\alpha}{J} = \overline{\underset{1\text{-}\alpha}{\Lambda} J}$$

$$\underset{1\text{-}\alpha}{\Lambda} J \in {}_{Z}\overset{S}{\nabla}_{\infty}\mathbb{C} \Rightarrow \overset{1\text{-}\alpha}{J} = \overline{\underset{1\text{-}\alpha}{\Lambda} J} \in \mho|^{Z}\overset{2}{\underset{\omega}{\triangle}}\check{\mathbb{C}}$$

$$\overset{1\text{-}\alpha}{J}\;\overset{\beta}{\daleth} = \overline{\underset{1\text{-}\alpha}{\Lambda} J}\;\overline{\underset{1\text{-}\beta}{\Lambda} \daleth} = \overline{\underbrace{\underset{1\text{-}\alpha}{\Lambda} J} \sharp \underbrace{\underset{1\text{-}\beta}{\Lambda} \daleth}}$$

$$ {}_{x}\Lambda_{1\text{-}\alpha}{}^{y} = \underset{x\llcorner\;\lrcorner}{\overset{1\text{-}\alpha}{\ulcorner y \urcorner}} = \operatorname{tr}\, \mathfrak{s}_x^{\nu}\, \overset{1\text{-}\alpha}{\ulcorner y \urcorner} $$

$$ \overline{\underset{1\text{-}\alpha}{\Lambda}\,\lrcorner} = \overset{1\text{-}\alpha}{\ulcorner \lrcorner} = \underline{\overline{\overset{1\text{-}\alpha}{\ulcorner \lrcorner}}} \Longrightarrow \nu^d \int_{dy}^{Z} {}_{x}\Lambda_{1\text{-}\alpha}{}^{y}\, {}_{y}\lrcorner = {}_{x}\underbrace{\underset{1\text{-}\alpha}{\Lambda}\,\lrcorner} = {}_{x}\underline{\overset{1\text{-}\alpha}{\ulcorner \lrcorner}} = \nu^d \int_{dy}^{Z} {}_{x}\underline{\overset{1\text{-}\alpha}{\ulcorner y \urcorner}}\; {}_{y}\lrcorner $$

$$ I = \nu^d \int_{dz/\pi^d}^{\mathbb{C}^d} \underbrace{\mathcal{E}_z^{\nu z}\mathcal{E}_z^{-\nu/2}}\, \overbrace{\mathcal{E}_z^{\nu z}\mathcal{E}_z^{-\nu/2}}^{*} = \nu^d \int_{dz/\pi^d}^{\mathbb{C}^d} {}^{z}\mathcal{E}_z^{-\nu}\, \mathcal{E}_z^{\nu}\, \overset{*}{\mathcal{E}}_z^{\nu} $$

$$ \urcorner \underset{\nu}{\bigstar} \dashv = \nu^d \int_{dz/\pi^d}^{\mathbb{C}^d} {}^{z}\mathcal{E}_z^{-\nu}\, {}^{z}\bar{\urcorner}\, {}^{z}\dashv = \nu^d \int_{dz/\pi^d}^{\mathbb{C}^d} {}^{z}\mathcal{E}_z^{-\nu}\, \mathcal{E}_z^{\nu}\, \underset{\nu}{\bar{\bigstar}} \urcorner \mathcal{E}_z^{\nu} \underset{\nu}{\bigstar} \dashv = \nu^d \int_{dz/\pi^d}^{\mathbb{C}^d} {}^{z}\mathcal{E}_z^{-\nu} \urcorner \underset{\nu}{\bigstar}\, \mathcal{E}_z^{\nu}\, \mathcal{E}_z^{\nu} \bigstar \dashv $$

$$ = \nu^d \int_{dz/\pi^d}^{\mathbb{C}^d} \urcorner \underset{\nu}{\bigstar}\, \underbrace{\mathcal{E}_z^{\nu z}\mathcal{E}_z^{-\nu/2}}\, \underbrace{\mathcal{E}_z^{\nu z}\mathcal{E}_z^{-\nu/2}} \bigstar \dashv = \nu^d \urcorner \underset{\nu}{\bigstar} \underbrace{\int_{dz/\pi^d}^{\mathbb{C}^d} \mathcal{E}_z^{\nu z}\mathcal{E}_z^{-\nu/2}\, \overbrace{\mathcal{E}_z^{\nu z}\mathcal{E}_z^{-\nu/2}}^{*}}\, \dashv $$

$$ \daleth = \nu^d \int_{dz/\pi^d}^{\mathbb{C}^d} \underbrace{\daleth \mathcal{E}_z^{\nu z}\mathcal{E}_z^{-\nu/2}}\, \overbrace{\mathcal{E}_z^{\nu z}\mathcal{E}_z^{-\nu/2}}^{*} = \nu^d \int_{dz/\pi^d}^{\mathbb{C}^d} {}^{z}\mathcal{E}_z^{-\nu}\, \daleth\, \mathcal{E}_z^{\nu}\, \overset{*}{\mathcal{E}}_z^{\nu} $$

$$ \operatorname{tr}\, \daleth = \nu^d \int_{dz/\pi^d}^{\mathbb{C}^d} \underbrace{\mathcal{E}_z^{\nu z}\mathcal{E}_z^{-\nu/2}} \bigstar \underbrace{\daleth \mathcal{E}_z^{\nu z}\mathcal{E}_z^{-\nu/2}} = \nu^d \int_{dz/\pi^d}^{\mathbb{C}^d} {}^{z}\mathcal{E}_z^{-\nu}\, \mathcal{E}_z^{\nu} \bigstar \underbrace{\daleth \mathcal{E}_z^{\nu}} = \nu^d \int_{dz/\pi^d}^{\mathbb{C}^d} {}^{z}\mathcal{E}_z^{-\nu}\; {}^{z}\overbrace{\daleth \mathcal{E}_z^{\nu}} $$

$$ \operatorname{tr}\, \mathfrak{s}_x^{\nu}\, \overset{1\text{-}\alpha}{\ulcorner y \urcorner} = \nu^d \int_{dz/\pi^d}^{Z} {}^{z}\mathcal{E}_z^{-\nu}\, \mathcal{E}_z^{\nu} \bigstar \underbrace{\mathfrak{s}_x^{\nu}\, \overset{1\text{-}\alpha}{\ulcorner y \urcorner}\, \mathcal{E}_z^{\nu}} = \nu^d \int_{dz/\pi^d}^{Z} {}^{z}\mathcal{E}_z^{-\nu}\; {}^{z}\overbrace{\mathfrak{s}_x^{\nu}\, \overset{1\text{-}\alpha}{\ulcorner y \urcorner}\, \mathcal{E}_z^{\nu}} $$