$$ {}_z\breve{\mathbb{C}}^{\lambda} = \overbrace{1-\bar z z}^{\lambda i + \ 1/2} \quad {\boxed{z\bar z}}_{1}^{\lambda i + \ 1/2|\lambda i + \ 1/2} = {\boxed{\frac{z\bar z}{z\bar z - 1}}}_{1}^{\lambda i + \ 1/2| - \lambda i + \ 1/2} $$

$$ \text{LHS} = \int_{du}^{\mathbb{T}} \left(\frac{1-|z|^2}{|u-z|^2}\right)^{\lambda i + \ 1/2} = \int_{dv/2\pi}^{0|2\pi} \left(\frac{1-|z|^2}{|{}^{iv}\mathfrak{e}-z|^2}\right)^{\lambda i + \ 1/2} = \left(1-|z|^2\right)^{\lambda i + \ 1/2} \int_{dv/2\pi}^{0|2\pi} \left|1-{}^{-iv}\mathfrak{e}z\right|^{-2\lambda i - 1} $$

$$ = \left(1-|z|^2\right)^{\lambda i + \ 1/2} \int_{dv/2\pi}^{0|2\pi} \left|\sum_{n \geqslant 0} \frac{(\lambda i + \ 1/2)_n}{n!} {}^{-niv}\mathfrak{e} z^n\right|^2 \underset{\text{orth}}{=} \left(1-|z|^2\right)^{\lambda i + \ 1/2} \sum_{n \geqslant 0} \frac{(\lambda i + \ 1/2)_n^2}{(n!)^2} |z|^{2n} = \text{RHS} $$

$$ {}_z\breve{\mathbb{C}}^{\lambda i + \ 1/2} = \left(1-|z|^2\right)^{\lambda i + \ 1/2} {}^{z\bar z}\begin{bmatrix}\lambda i + \ 1/2 : \lambda i + \ 1/2 \\ 1\end{bmatrix} = \sum_{j+k=n} \frac{(- 1/2 - \lambda i)_j}{j!} \frac{(\ 1/2 + \lambda i)_k^2}{(k!)^2} $$

$$ \text{Harish-Chandra} \ \left|\breve{\mathbb{C}}_{\lambda}\right|^{-2} = \pi\lambda \tanh(\pi\lambda) $$

$$ \left|\frac{\Gamma_{\lambda i + \ 1/2}\Gamma_{-\lambda i + \ 1/2}}{\Gamma_{2\lambda i}}\right|^2 = 4\pi\lambda\tanh(\pi\lambda) $$

$$ {}_z\varphi^{\lambda} = \int_{dw}^{S} \left(\frac{1-|z|^2}{|z-w|^2}\right)^{\frac{1-i\lambda}{2}} = \left(1-|z|^2\right)^{\frac{1-i\lambda}{2}} {}_{|z|^2}\begin{bmatrix}\frac{1+i\lambda}{2} : \frac{1+i\lambda}{2} \\ 1\end{bmatrix} = {}_{-|z|^2/1-|z|^2}\begin{bmatrix}\frac{1+i\lambda}{2} : \frac{1-i\lambda}{2} \\ 1\end{bmatrix} $$