The j Corrections

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<u>KV-Naive:</u> If $f, g \in Fun(G)^G$ and $(\Phi f) \in Fun(\mathfrak{g})^G$ is defined by $(\Phi f)(x) = j^{1/2}(x) f(e^x)$ with j as below, then

$$\underset{\substack{\uparrow \\ \text{convolution} \\ \text{on } G}}{\Phi(f * g)} = \Phi(f) \underset{\substack{\uparrow \\ \text{convolution} \\ \text{on } \mathfrak{g}}}{*} \Phi(g)$$

Torossian's KV:

$$\int u(x)v(y)\frac{j^{1/2}(x)j^{1/2}(y)}{j^{1/2}(Z(x,y))} f(Z(x,y))dxdy = \int u(x)v(y)f(x+y)dxdy$$

with $Z(x,y) := \log e^x e^y$

and $j(x) = \det\left(\frac{1-e^{-ad\,x}}{ad\,x}\right)$

$= \exp tr \log \frac{1-e^{-ad\,x}}{ad\,x}$

Rewritten in $\mathcal{U}(\mathfrak{g})$:

$$\int dxdy\, f(x) g(y) \frac{J(x)J(y)}{J(\log e^x e^y)} \cdot e^x e^y = \int dxdy\, f(x)g(y)\, e^{x+y}$$

$$\left(J(z) := j^{1/2}(z)\right)$$

What is $J(\log e^x e^y)$?

I need a topological interpretation for "$f(\log e^x e^y)$"

<u>Aside:</u> are $e^x e^y$ and e^{x+y} conjugate?

e^{x+y} contains $xyxy$ which cannot be conjugated away.