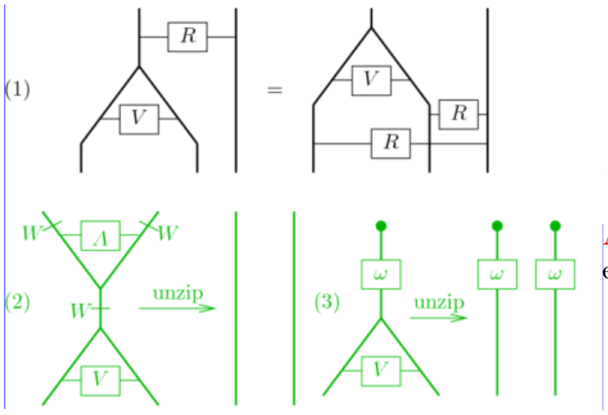
Zw and AT

May-03-10
1:37 PM



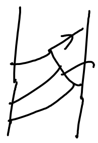
$$j(gh) = j(g) + g \cdot j(h),$$

$$j(\exp(u)) = \frac{e^u - 1}{u} \cdot \operatorname{div}(u)$$

Alekseev-Torossian statement. There is an element $F \in \mathrm{TAut}_2$ with

$$F(x+y) = \log e^x e^y$$

and $j(F) \in \operatorname{im} \tilde{\delta} \subset \mathrm{tr}_2$, where for $a \in \mathrm{tr}_1$, $\tilde{\delta}(a) := a(x) + a(y) - a(\log e^x e^y)$.

Take $V = e^c e^{u(d)}$, with $c \in tr_2$ (a primitive sum of wheels), with $d \in tder_2$, and with $u : tder_2 \to A^w(\uparrow_2)$ the "upper" imbedding, with images like 

Take $W = e^b$, with $b \in tr_1$.

The equations become:

(1) $\Leftrightarrow$ with $F = V$, $F(x+y) = \log e^x e^y$

(2) $\Leftrightarrow$ $VV^* = I$ $\Leftrightarrow$ $I = e^c e^{u(d)} e^{-l(d)} e^c$

$$= e^c e^{u(d)} e^{-u(d) + div(d)} e^c =$$

$$= e^{2c} e^{\frac{e^d - 1}{d} div(d)}$$

$\Leftrightarrow$ $c = \frac{1}{2} \frac{e^d - 1}{d} div(d) = \frac{1}{2} j(d)$

(3) $\Leftrightarrow$ $e^c e^{u(d)} e^{b(x+y)} | = e^{b(x)} e^{b(y)} |$

$\Leftrightarrow$ $e^c e^{b(\log e^x e^y)} = e^{b(x)} e^{b(y)}$

$\Leftrightarrow$ $\frac{1}{2} j(d) = b(x) + b(y) - b(\log e^x e^y)$

Aside
$e^{A+B} = e^A e^{\frac{e^{ad A} - 1}{ad A} B}$?

No in general, but YES if B belongs to an Abelian ideal!