17-1350-AKT Tue Mar 7, Brute Hours 8-9: The polished g0 invariant; deriving the logos for g1

January 19, 2017 2:20 PM

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Swapping exponentials:

$$\mathbb{O}\left(e^{\alpha f+\beta e}\,\middle|\, f\,e\right)=\mathbb{O}\left(e^{-\alpha\beta h+\beta e+\alpha f}\left(1+\epsilon\left(2l\alpha\beta+f\alpha^2\beta+e\alpha\beta^2-\frac{1}{2}h\alpha^2\beta^2\right)\right)\middle|\, e\,l\,f\right)$$

$$=\mathbb{O}\left(e^{-\alpha\beta h+\beta e+\alpha f}(1+\epsilon\Lambda_0):elf\right),$$

where Λ is a polynomial in α,β & elf. So

$$\mathbb{O}\left(e^{\alpha f+\beta e+\Gamma ef}\,/\,fe\right)=\mathbb{O}\left(\underbrace{e^{\Gamma\partial_\alpha\partial_\beta}e^{-\alpha\beta h+\beta e+\alpha f}(1+\epsilon\Lambda_0)}_{\phi=?}\,/\,elf\right)$$

$$\phi=e^{\Gamma\partial_\alpha\partial_\beta}\left(1+\epsilon\Lambda_0\left(\begin{smallmatrix}\alpha\to\partial_f\\ \beta\to\partial_e\end{smallmatrix}\right)\right)e^{-\alpha\beta h+\beta e+\alpha f}$$

$$=(1+\epsilon\Lambda_0(\partial_f,\partial_e))\,e^{\Gamma\partial_\alpha\partial_\beta}e^{-\alpha\beta h+\beta e+\alpha f}=(1+\epsilon\Lambda_0(\partial_f,\partial_e))\Psi$$

with $\Psi=\nu e^{\nu(-\alpha\beta h+\beta e+\alpha f)}$, $\nu=(1+h\Gamma)^{-1}$

$$=(1+\epsilon\Lambda)\cdot\Psi\quad\text{where}\quad\Lambda=\Psi^{-1}\Lambda_0(\partial_f,\partial_e)\Psi.$$

done line

If time, continue as gentle:

4. properties of $\mathcal{A}$:
   a. $\mathcal{A}(\uparrow_S)$ is a meta-Hopf-algebra.

gentle previous done line

   b. $\mathcal{A}(\uparrow)$ is a commutative & co-commutative bi-algebra. } mentioned
   c. $\mathcal{A}(\uparrow_S)\cong\mathcal{A}(*_S)=\mathcal{B}(S)$ but first,
5. $\mathcal{A}^c\cong\mathcal{A}^t$
6. The relationship w/ metrized Lie algebras.
7. PBW.