The Free Lie MBCP

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12:08 PM

$$bh(m,n) := \bigoplus_n FL(x^1,\dots,x^m) \qquad (\oplus tr_m)$$

Q. Suppose I know the infinitesimal swap operation on $bh(m,n)$. How do I deduce the global one?

Ans. I'm not sure there is a meaningful infinitesimal swap operation.

$$\beta = (\beta_1 \dots \beta_n) \in bh(m,n)$$

$$(1 - C_i^j)\gamma = \beta /\!\!\cdot\, x^j \to z$$

where $C_i^j \gamma := \gamma /\!\!\cdot\, x^j \mapsto e^{-\beta_i} z e^{\beta_i}$ (nice tooth)

Take II.

$$bh(T,H) := (FL(T))^H \quad (\oplus tr(T))$$

$\beta \in bh(T,H)$ $\quad x, y$ tails, h head

$$A_y^{hx}(\beta) = \beta /\!\!/\!\cdot\, \underbrace{x \mapsto e^{ad(h)}(y)}_{C_y^{hx} = C}$$

Test.

$$\beta /\!\!/ hm_h^{h_1h_2} /\!\!/ A_y^{hx} \stackrel{?}{=} \beta /\!\!/ A_z^{h_1x} /\!\!/ A_y^{h_2x} /\!\!/ hm_h^{h_1h_2}$$

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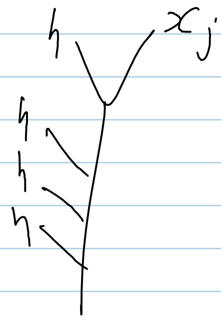
$[x,y] = C_x y - C_y x$

$$h \longmapsto \sum \alpha_i x_i$$

$$\mathrm{ad}(h)\left(\sum \alpha'_j x_j\right) = \sum_{i \neq j} \alpha_i \alpha'_j \left(C_i x_j - C_j x_i\right)$$

$$e^{\mathrm{ad}(h)}(x_j) =$$



~~There should be meta-semi-direct-product of n vector fields on $\mathfrak{g}^m$; perhaps better, "n one parameter groups of diffeomorphisms of $\mathfrak{g}^m$".~~