

λ to β

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In λ ,

$$\mu \parallel_0 (y \mapsto e^{\mu x} \bar{y} e^{-\mu x} = e^{\text{ad}^{\mu x}(\bar{y})})$$

In β , $\mu = \sum t_i h_j \alpha_{ij}$

$$\mu x = \sum t_i \alpha_{ix}$$

A general β calculation:

$$[x, y] = c_x y - c_y x$$

$$\begin{aligned} t_y \parallel_0 y \mapsto \text{ad}^{\sum \alpha_i t_i}(y) &= \sum \alpha_i [t_i, y] = \\ &= \sum (\alpha_i c_i t_y - \alpha_i c_y t_i) \end{aligned}$$

So $t_y \parallel_0 y \mapsto e^{\text{ad}^{\sum \alpha_i t_i}}(\bar{y}) =$

$$e^{\sum \alpha_i c_i t_y} \bar{y} - \sum_i \alpha_i c_y t_i \frac{e^{\sum \alpha_j c_j} - 1}{\sum \alpha_j c_j}$$

