

The double of $U_{\eta,\gamma}$

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(170513) $U_{\eta,\gamma}$ conventions: $A = \langle g, G = e^{\eta g}, e \rangle / ([g, e] = \gamma e)$ with $\Delta(g, G, e) = (g_1 + g_2, G_1 G_2, e_1 G_2 + e_2)$; $S(g, G, e) = (-g, G^{-1}, -e G^{-1})$ and dual $A^* = \langle h, H = e^{\gamma h}, f \rangle / ([h, f] = -\eta h)$ with $\Delta(h, H, f) = (h_1 + h_2, H_1 H_2, f_1 + H_1 f_2)$; $S(h, H, f) = (-h, H^{-1}, -H^{-1} f)$. Pairing by $(g, e)^* = (h, f)$.

(160611) The quantum double $\mathcal{DA} := \begin{array}{c} a \\ | \\ \hline \end{array} = \begin{array}{c} \diagup \quad | \quad \diagdown \\ \hline \end{array} \begin{array}{c} a \\ | \\ \hline \end{array} \begin{array}{c} \diagdown \quad | \quad \diagup \\ \hline \end{array} \psi$
 $A^{*,op} \otimes A$ with $(\phi a)(\psi b) := \psi \begin{array}{c} | \\ \hline \end{array} \begin{array}{c} \diagup \quad | \quad \diagdown \\ \hline \end{array} \begin{array}{c} a \\ | \\ \hline \end{array} \psi$
 $\langle S a_1, \psi_1 \rangle \langle a_3, \psi_3 \rangle \langle \psi_2 \phi \rangle (a_2 b)$. What problem does it solve?

$$\begin{aligned} gh &= \langle S g_1, h_1 \rangle \langle g_3, h_3 \rangle h_2 g_2 = \\ &= \langle -g, h_1 \rangle \langle 1, h_3 \rangle h_2 1 + \langle 1, h_1 \rangle \langle 1, h_3 \rangle h_2 g + \langle 1, h_1 \rangle \langle g, h_3 \rangle h_2 1 \\ &= -h_2 + hg + h_2 = hg \end{aligned}$$

$$\begin{aligned} gF &= \langle -g, f_1 \rangle \langle 1, f_3 \rangle f_2 1 + \langle 1, f_1 \rangle \langle 1, f_3 \rangle f_2 g + \langle 1, f_1 \rangle \langle g, f_3 \rangle f_2 \\ &= -\gamma f + fg + 0 \end{aligned}$$