

$$D_{\omega} \underbrace{Z \underset{\bullet}{\Delta} \overset{|n}{\mathbb{C}}}_{\text{metrep}} \xleftarrow{+G^{|n}} G \rtimes D_{\omega} \underbrace{Z \underset{\bullet}{\Delta} \overset{|n}{\mathbb{C}}}_{\text{metrep}}$$

$$\zeta|z \overbrace{+G_g^{|n}}^{\bullet} = \zeta + z \Delta_g^n \zeta + z g - z g | z g \blacktriangleright$$

$$D_{\omega} \underbrace{Z \underset{\bullet}{\Delta} \overset{|n}{\mathbb{C}}}_{\text{metrep}} \xleftarrow{+G_w^{-|n}} Z \underset{\bullet}{\Delta} \overset{|n}{\mathbb{C}}$$

$$\begin{array}{ccc} \uparrow +G_g^{|n} & & \downarrow w^* \overset{|n}{+G_g} \\ D_{\omega} \underbrace{Z \underset{\bullet}{\Delta} \overset{|n}{\mathbb{C}}}_{\text{metrep}} & \xleftarrow{+G_{wg}^{-|n}} & Z \underset{\bullet}{\Delta} \overset{|n}{\mathbb{C}} \end{array}$$

$$D_{\omega} \underbrace{Z \underset{\bullet}{\Delta} \overset{|n}{\mathbb{C}} \rtimes D^{-\nu}}_{\text{u-rep}} \xleftarrow{+G^{|n} \rtimes D^{-\nu}} G \rtimes D_{\omega} \underbrace{Z \underset{\bullet}{\Delta} \overset{|n}{\mathbb{C}} \rtimes D^{-\nu}}_{\text{u-rep}}$$

$$\zeta|z \overbrace{+G_g^{|n} \rtimes \Delta_g^{-\nu}}^{\bullet} = z \Delta_g^{-\nu} \zeta + z \Delta_g^{-n} \zeta + z g - z g | z g \blacktriangleright$$

$$Z \underset{\bullet}{\Delta} \overset{|n}{\mathbb{C}} \rtimes D^{-\nu} \xrightarrow[\overset{z}{D_w^{-\nu}}]{\overset{z}{+G_w^{|n}}} Z \underset{\bullet}{\Delta} \overset{|n}{\mathbb{C}} \rtimes D^{-\nu}$$

$$\begin{array}{ccc} \uparrow \overset{z}{+G_g^{|n}} \quad \overset{z}{\Delta_g^{-\nu}} & & \downarrow \overset{w^*}{+G_g^{|n}} \quad \overset{w^*}{\Delta_g^{-\nu}} \\ Z \underset{\bullet}{\Delta} \overset{|n}{\mathbb{C}} \rtimes D^{-\nu} & \xrightarrow[\overset{zg}{D_{wg}^{-\nu}}]{\overset{zg}{+G_{wg}^{|n}}} & Z \underset{\bullet}{\Delta} \overset{|n}{\mathbb{C}} \rtimes D^{-\nu} \end{array}$$

$$\begin{array}{ccc}
D \begin{array}{c} \triangleleft \\ \underline{w} \end{array} \begin{array}{c} 2 \\ Z \end{array} \begin{array}{c} \triangleleft \\ \bullet \end{array} \begin{array}{c} |n \\ \mathbb{C} \otimes D^{-\nu} \end{array} \xleftarrow[\Delta_w^{-\nu}]{+G_w^{|n|}} & Z \begin{array}{c} \triangleleft \\ \bullet \end{array} \begin{array}{c} |n \\ \mathbb{C} \otimes D^{-\nu} \end{array} & \\
\begin{array}{c} +G_g^{|n|} \\ \Delta_g^{-\nu} \end{array} \uparrow & & \begin{array}{c} w^* +G_g^{|n|} \\ w^* \Delta_g^{-\nu} \end{array} \downarrow \\
D \begin{array}{c} \triangleleft \\ \underline{w} \end{array} \begin{array}{c} 2 \\ Z \end{array} \begin{array}{c} \triangleleft \\ \bullet \end{array} \begin{array}{c} |n \\ \mathbb{C} \otimes D^{-\nu} \end{array} \xleftarrow[\Delta_{wg}^{-\nu}]{+G_{wg}^{|n|}} & Z \begin{array}{c} \triangleleft \\ \bullet \end{array} \begin{array}{c} |n \\ \mathbb{C} \otimes D^{-\nu} \end{array} &
\end{array}$$