

$$g \ltimes \gamma \in \mathfrak{g} \rightarrow G \ltimes \mathfrak{g} \ni g:\gamma$$

$$T^\# \mathfrak{g} \rtimes G \xrightarrow{\text{plex}} T^\# \mathfrak{g}$$

$$\underline{\gamma:\ell} \rtimes g = \underline{\bar{g}^{-1} \ltimes \gamma} \ltimes \underline{\ell \rtimes g}$$

$$T^\# \mathfrak{g} \xrightarrow[\text{mom}]{\Phi} \mathfrak{g}^\dagger$$

$$\gamma:\ell \Phi \gamma = \ell \underline{\gamma \ltimes \gamma}$$

$$\begin{array}{ccc}
 T^\# \mathfrak{g} & \xrightarrow{\tau} & \mathfrak{g} \xrightarrow{\gamma} \mathbb{R} \\
 & \searrow & \nearrow \\
 & & \tau \ltimes \gamma \\
 & & \underline{\tau \ltimes \gamma} \rtimes \underline{\tau \ltimes \mathfrak{g}} = 0
 \end{array}$$

$$\begin{array}{ccccc}
 & & \mathfrak{g}^\dagger & & \\
 & & \uparrow \Phi & & \\
 & \in & T^\# \mathfrak{g} & \xrightarrow{\tau} & \mathfrak{g} \\
 & & \uparrow \iota & & \searrow \gamma \\
 \Phi P & \xrightarrow{\iota} & T^\# \mathfrak{g} & \xrightarrow{\tau \ltimes \gamma} & \mathbb{R} \\
 & & \downarrow \pi & & \nearrow G \text{ inv} \\
 \Phi P & \xrightarrow{\pi} & \overline{\Phi P} & \xrightarrow{\overline{\tau \ltimes \gamma}} & \mathbb{R} \\
 & & \downarrow \pi & & \nearrow G \text{ inv} \\
 \Phi P & \xrightarrow{\pi} & \overline{\Phi P} & \xrightarrow{\overline{\tau \ltimes \gamma}} & \mathbb{R} \\
 & & \downarrow \pi & & \nearrow G \text{ inv} \\
 \Phi P & \xrightarrow{\pi} & \overline{\Phi P} & \xrightarrow{\overline{\tau \ltimes \gamma}} & \mathbb{R} \\
 & & \downarrow \pi & & \nearrow G \text{ inv} \\
 \Phi P & \xrightarrow{\pi} & \overline{\Phi P} & \xrightarrow{\overline{\tau \ltimes \gamma}} & \mathbb{R}
 \end{array}$$

$$\begin{cases} \pi \ltimes \overline{\tau \ltimes \gamma} = \iota \ltimes \underline{\tau \ltimes \gamma} \\ \pi \ltimes \overline{\tau \ltimes \mathfrak{g}} = \iota \ltimes \underline{\tau \ltimes \mathfrak{g}} \end{cases} \Rightarrow \pi \ltimes \underline{\tau \ltimes \gamma} \rtimes \underline{\tau \ltimes \mathfrak{g}} = \iota \ltimes \underline{\tau \ltimes \gamma} \rtimes \underline{\tau \ltimes \mathfrak{g}} = 0$$