

$$T_f = \int_{dg}^G \bar{g}^\nu j^{\circ \mathfrak{X} g} f \overset{*}{j} g^\nu : \quad T_f \varphi = \int_{dg}^G \underline{\bar{g}^\nu j}^{\circ \mathfrak{X} g} f \underline{j g^\nu} \varphi = \int_{dg}^G \underline{\bar{g}^\nu j}^{\circ \mathfrak{X} g} f \, {}^g \widetilde{\varphi}$$

$${}^y \widetilde{T_f \varphi} = {}^y \overline{\lambda_E \hat{f} \widetilde{\varphi}} = \int_{dg}^G {}^y \bar{g} E^g \hat{f} \, {}^g \widetilde{\varphi} = \int_{dg}^G \underline{j y^\nu \bar{g}^\nu j}^{\circ \mathfrak{X} g} f \, {}^g \widetilde{\varphi} = \overset{*}{j} y^\nu \int_{dg}^G \underline{\bar{g}^\nu j}^{\circ \mathfrak{X} g} f \, {}^g \widetilde{\varphi} = \overline{\int_{dg}^G \underline{\bar{g}^\nu j}^{\circ \mathfrak{X} g} f \, {}^g \widetilde{\varphi}}$$

$${}^z g^{\, z \mathfrak{X} g} \mathcal{K}_{w \mathfrak{X} g} \, {}^w \overset{*}{g} = {}^z \mathcal{K}_w$$

$${}^o g^{\, o \mathfrak{X} g} \mathcal{K}_{o \mathfrak{X} g} \, {}^o \overset{*}{g} = {}^o \mathcal{K}_o = 1$$

$${}^o \mathfrak{X} g \mathcal{K}_{o \mathfrak{X} g} = {}^o g^{-1} \, {}^o \overset{*}{g}^{-1} \Rightarrow {}^o \mathfrak{X} g \mathcal{K}_{o \mathfrak{X} g}^{-1} = {}^o \overset{*}{g} \, {}^o g$$

$${}^z \overline{g^\nu \varphi} = {}^z g^{\, z \mathfrak{X} g} \varphi$$

$$\overset{*}{j} \varphi = {}^o \varphi \text{ hol disc}$$

$${}^g \widetilde{\varphi} = \overset{*}{j} g^\nu \varphi = {}^o \overline{g^\nu \varphi} = {}^o g^{\, o \mathfrak{X} g} \varphi$$

$$T_f \varphi = P_\nu (\varphi f) : \quad {}^z \overline{T_f \varphi} = \int_{dw}^B {}^z \mathcal{D}_w^\nu \, {}^w \mathcal{D}_w^{\nu - p} \, {}^w f \, {}^w \varphi$$

$$\begin{aligned} \psi \overset{\mathfrak{X}}{\nu} \underline{T_f \varphi} &= \int_{dg}^G \psi \overset{\mathfrak{X}}{\nu} \underline{\bar{g}^\nu j^{\circ \mathfrak{X} g} f \overset{*}{j} g^\nu \varphi} = \int_{dg}^G \underline{j g^\nu \psi \overset{\mathfrak{X}}{\nu}}^{\circ \mathfrak{X} g} \underline{f \overset{*}{j} g^\nu \varphi} = \int_{dg}^G {}^g \widetilde{\psi \overset{\mathfrak{X}}{\nu}}^{\circ \mathfrak{X} g} f \, {}^g \widetilde{\varphi} \\ &= \int_{dg}^G \overline{{}^o g^{\, o \mathfrak{X} g} \psi \overset{\mathfrak{X}}{\nu} \, {}^o g^{\, o \mathfrak{X} g} \varphi}^{\circ \mathfrak{X} g} f = \int_{dg}^G \overline{{}^o \mathfrak{X} g \psi \overset{\mathfrak{X}}{\nu} \, {}^o \overset{*}{g} \, {}^o g^{\, o \mathfrak{X} g} \varphi}^{\circ \mathfrak{X} g} f = \int_{dg}^G \overline{{}^o \mathfrak{X} g \psi \overset{\mathfrak{X}}{\nu} \, \mathcal{K}_{o \mathfrak{X} g}^{-1} \, {}^o \mathfrak{X} g \varphi}^{\circ \mathfrak{X} g} f \\ &= \int_{dw}^B \overline{{}^w \psi \overset{\mathfrak{X}}{\nu} \, {}^w \mathcal{K}_w^{-1} \, {}^w \varphi}^w f = \int_{dw}^B {}^w \mathcal{D}_w^{-p} \, {}^w \psi \overset{\mathfrak{X}}{\nu} \overline{{}^w \mathcal{D}_w^\nu \, {}^w f \, {}^w \varphi} = \int_{dw}^B {}^w \psi \overset{\mathfrak{X}}{\nu} \overline{{}^w \mathcal{D}_w^{\nu - p} \, {}^w f \, {}^w \varphi} = \psi \overset{\mathfrak{X}}{\nu} \overline{f \varphi} = \psi \overset{\mathfrak{X}}{\nu} \overline{T_f \varphi} \end{aligned}$$