$$\hat{U}_g^{-1}\daleth(x) = \hat{\varrho}_g\,(x)\,\daleth\left(\hat{g}\cdot x\right)$$

$$-\underline{\hat{U}}_\gamma\daleth(x) = \underline{\hat{\varrho}}_\gamma\,(x)\,\daleth(x) + \hat{d}_\gamma\daleth(x)$$

$$\hat{d}_\gamma\daleth(x) = T_x\,(\daleth)\;\hat{\gamma}_x$$

$$-\underline{\hat{U}}_\gamma\phi\,(x) = \underline{\hat{\varrho}}_\gamma\,(x)\,\phi\,(x) + \hat{\partial}_\gamma\phi\,(x)$$

$$\hat{\partial}_\gamma\phi\,(x) = \underline{\phi}\,(x)\;\hat{\gamma}\,(x)$$

$$-\underline{\hat{U}}_w\psi\,(x) = \underline{\hat{\varrho}}_w\,(x)\,\psi\,(x) + 2\,\underline{\psi}\,(x)\,w\,\overset{*}{u}\,x$$

$$\underline{\hat{\varrho}}_w\,(x) = \alpha_w\,(x) + \beta_w\,(x)$$

$$\alpha_w + \bar{\beta}_w = c\cdot w|u + \frac{\underline{\mathcal{L}}_u\,(x)}{\mathcal{L}_u\,(x)}x\,\overset{*}{u}\,w_1$$

$$\alpha_w + \bar{\beta}_w + \overline{\alpha_w + \bar{\beta}_w} = \alpha_w + \beta_w + \overline{\alpha_w + \beta_w} = 2\ \mathrm{Re}\ \underline{\hat{\varrho}}_w\,(x) = c\,(w|u + u|w) + \frac{\underline{\mathcal{L}}_u\,(x)}{\mathcal{L}_u\,(x)}x\,\overset{*}{u}\,\overbrace{w_1 + \overset{*}{w}_1}$$

$$-\underline{\hat{U}}_w\psi = \alpha_w\psi + \beta_w\psi + 2\,\partial_{w\overset{*}{u}x}\,\psi$$

$$-\overbrace{\alpha_w + 2\partial_{w\overset{*}{u}x}}\phi\bowtie\psi = \phi\bowtie\beta_w\psi$$

$$\phi\bowtie\underline{\hat{U}}_w\psi = -\underline{\hat{U}}_w\phi\bowtie\psi$$

$$-\phi\bowtie\overbrace{\alpha_w + \beta_w + 2\partial_{w\overset{*}{u}x}}\psi = \overbrace{\alpha_w + \beta_w + 2\partial_{w\overset{*}{u}x}}\phi\bowtie\psi$$

$$-\phi\bowtie\overbrace{\alpha_w + 2\partial_{w\overset{*}{u}x}}\psi = \overbrace{\beta_w\phi}\bowtie\psi$$

$$\phi \star \underline{\hat{U}}_w \psi = \overbrace{\beta_w \phi} \star \psi - \phi \star \overbrace{\beta_w \psi}$$

$$\begin{aligned}\text{LHS} &= -\phi \star \overbrace{\alpha_w + \beta_w + 2\partial_{w\overset{*}{u}x}} \psi = -\phi \star \overbrace{\alpha_w + 2\partial_{w\overset{*}{u}x}} \psi - \phi \star \overbrace{\beta_w \psi} \\ &= \overbrace{\beta_w \phi} \star \psi - \phi \star \overbrace{\beta_w \psi}\end{aligned}$$

$$-\underline{\hat{U}}_w \psi(x) = \left(c\,(w|u + u|w) + \frac{\underline{\mathcal{L}}_u(x)}{\mathcal{L}_u(x)} x\overset{*}{u}\overbrace{w_1 + \overset{*}{w}_1} \right) \psi(x) + 2\,\partial_{w\overset{*}{u}x}\, \psi$$

$$P\,\underline{\hat{U}}_w P = P\,\underbrace{\bar{\beta}_w - \beta_w} P$$

$$\hat{\partial}\,(x) > 0 \Longrightarrow \underline{\hat{\partial}} \in \mathbb{R}\not\!\square\, \beta_w = \bar{\alpha}_w$$

$$\phi \star \underbrace{\underline{\psi}\,(x)\, w\overset{*}{u}x} = \phi \star \overbrace{\alpha_w \psi}$$

$$\phi \star \overbrace{\underline{\psi}\,(x)\, w\overset{*}{u}x} - \underbrace{\underline{\phi}\,(x)\, w\overset{*}{u}x} \star \psi = \phi \star \overbrace{\bar{\beta}_w \psi} - \overbrace{\bar{\beta}_w \phi} \star \psi = \phi \star \overbrace{\left(\bar{\beta}_w - \beta_w\right) \psi} = \phi \star \underline{\hat{U}}_w \psi$$