

co basis  $\mathcal{A} = \mathcal{A}^1 \mid \mathcal{A}^i \mid \mathcal{A}^p$

$$\overset{\#}{X} \ni \mathcal{A}^i \cdot 1 \xleftarrow[\text{lin}]{\mathcal{A}} \mathbb{R}^p \ni 1$$

$$\overset{\#}{X} \xleftarrow{\mathcal{A}} \mathbb{R}^p$$

$$\cup \qquad \cup$$

$$\overset{\#}{X}_{\mathcal{A}} \xleftarrow{\mathcal{A}} \mathbb{R}^p_+$$

$$\overset{\#}{X}_{\mathcal{A}} = \langle \mathcal{A}^1 : \mathcal{A}^i : \mathcal{A}^p \rangle$$

$$\mathbb{C} \xleftarrow{\mathcal{L}} \overset{\#}{X} \supset \Omega \text{ supp}$$

$$\mathbb{C} \xleftarrow{\mathcal{L}_{\mathcal{A}}} \mathbb{R}^p \supset \mathbb{R}^p_+ \text{ supp}$$

$$\widehat{\mathcal{L}}_{\mathcal{A}^1} = \mathcal{L}_{\mathcal{A}^1}$$

$$\mathcal{L}_{\mathcal{A}^1} = \int_{d^1}^{\mathbb{R}^p_+} e^{-i\mathcal{L}^1} \mathcal{L}_{\mathcal{A}^1}$$

$$\mathcal{L} \in \mathbb{R}^p \xrightarrow{\widehat{\mathcal{L}}_{\mathcal{A}^1}} \mathbb{C}$$

$$\mathcal{L}_{\mathcal{A}^1} = \frac{\partial \mathcal{L}}{\partial \mathcal{L}^i}$$

$$\mathcal{L} \in \overset{\#}{\Omega} + iX \subset X^{\mathbb{C}} = \mathbb{C}^n$$

$$\widehat{\mathcal{L}}_{\mathcal{A}^1}^{\mathcal{L}} = \det \left[ \mathcal{A}^1 \mid \cdot \mid \mathcal{A}^p \mid d\mathcal{A}^i \widehat{\mathcal{L}}_{\mathcal{A}^1}^{\mathcal{L}^i} \mid \cdot \mid d\mathcal{A}^i \widehat{\mathcal{L}}_{\mathcal{A}^1}^{\mathcal{L}^i} \right]$$

$$z \in X \cap \ker \mathcal{A}$$

$$z^i = z \mathcal{A}^i = \underline{z + \ker \mathcal{A}} \mathcal{A}^i$$

$$\text{dual vector basis } \frac{\mathcal{L}^1}{\mathcal{L}^i} \mathcal{L}^p$$

$$1 \in X \cap \ker \mathcal{A}$$

$$1 \mathcal{A}^j = \delta^j$$

$$\overline{1}^z = \frac{\partial \eta}{\partial \mathcal{A}^i} = \frac{z + t_i^1 \eta}{0} \text{ diff op } X \cap \ker \mathcal{A} \xrightarrow{\eta} \mathbb{C}$$

$$\text{ONB } \alpha v \in X_c^{1/2}$$

$$d \mathcal{A}^i = dv^j \frac{\partial \mathcal{A}^i}{\partial v^j} = dv^j \mathcal{A}^i_j$$

$$\begin{aligned} & \det \mathcal{A}^1 | \cdot | \mathcal{A}^p | dv^j \mathcal{A} | \cdot | dv^j \mathcal{A} \\ &= \underline{dv^1} \ddot{\times} \underline{dv^q} \det \mathcal{A}^1 | \mathcal{A} | \mathcal{A}^p | \mathcal{A} | \cdot | \mathcal{A} \end{aligned}$$

$$\mathcal{A}^1 | \cdot | \mathcal{A}^p | dv^j \mathcal{A} | \cdot | dv^j \mathcal{A} = \begin{array}{c|c} 1 & 0 \\ \hline \frac{dv^1}{\cdot} & \frac{dv^q}{\cdot} \\ \hline \frac{dv^1}{\cdot} & \frac{dv^q}{\cdot} \end{array} \mathcal{A}^1 | \cdot | \mathcal{A}^p | \mathcal{A} | \cdot | \mathcal{A}$$

$$\begin{aligned} & \det \mathcal{A}^1 | \mathcal{A}^i | \mathcal{A}^p | \mathcal{A}^1_{-1 i_1} \mathcal{A} | \mathcal{A}^j_{-j i_j} \mathcal{A} | \mathcal{A}^q_{-q i_q} \mathcal{A} \\ &= \underline{dv^1} \ddot{\times} \underline{dv^q} \det \mathcal{A}^1 | \mathcal{A}^i | \mathcal{A}^p | \mathcal{A}^1_{-1 i_1} \mathcal{A} | \mathcal{A}^j_{-j i_j} \mathcal{A} | \mathcal{A}^q_{-q i_q} \mathcal{A} \end{aligned}$$

$$\text{LHS} = \det \mathcal{A}^1 | \mathcal{A}^i | \mathcal{A}^p | \mathcal{A}^1_{-1 i_1} \mathcal{A} dv^\alpha | \mathcal{A}^j_{-j i_j} \mathcal{A} dv^\alpha | \mathcal{A}^q_{-q i_q} \mathcal{A} dv^\alpha = \text{RHS}$$

$$\det \mathcal{A}^1 | \mathcal{A}^i | \mathcal{A}^p | \mathcal{A}^1_{-1 i_1} \mathcal{A} | \mathcal{A}^j_{-j i_j} \mathcal{A} | \mathcal{A}^q_{-q i_q} \mathcal{A} e^{x|1} = \det \mathcal{A}^1 | \mathcal{A}^i | \mathcal{A}^p | \mathcal{A}_1 \mathcal{A} | \mathcal{A}_j \mathcal{A} | \mathcal{A}_q \mathcal{A} e^{x|1}$$

$$\mathcal{A}^j_{-j i_j} \mathcal{A} \mathcal{A} = \mathcal{A}^j_{-j i_j} \mathcal{A} = \mathcal{A}_j \mathcal{A}$$

endo von  $X$

$$\mathcal{L} T_{\mathcal{A}} = \mathcal{L} \mathcal{A}^1 | \mathcal{L} \mathcal{A}^i | \mathcal{L} \mathcal{A}^p | \mathcal{L} \mathcal{A}_1 \mathcal{A} | \mathcal{L} \mathcal{A}_j \mathcal{A} | \mathcal{L} \mathcal{A}_q \mathcal{A}$$

$$\mathcal{L} \mathcal{A} = \mathcal{L}^{0|1} \ell_{\mathcal{A}}$$

$$\ell_{\mathcal{A}} = P_{e+v^2}^{-1/2} P_{2c-e+v}$$

$$L_{-j} \mathcal{A} = \frac{\partial L \mathcal{A}}{\partial v^j} = L v_j^0 \mathcal{A} = v_j^0 L \mathcal{A} = v_j L^{0|1} \underline{\ell} = L^{0|1} v_j^0 \underline{\ell}$$

$$L_{-j} \mathcal{A} \mathbb{1} = L^{0|1} v_j^0 \underline{\ell} \mathbb{1}$$

$$L \mathcal{A} \mathbb{1} = L P_{e+v^2}^{-1/2} P_{2c-e+v} \mathbb{1}$$