

$$\begin{aligned} \mathfrak{E}_e^{u_\ell - e} | \mathfrak{U} \mathbb{I} &= \mathfrak{E}_{u_\ell - e}^{u_\ell - e} | \mathfrak{U} \mathbb{I} \times \mathfrak{E}_-^{u_\ell - e} | \mathfrak{U} \mathbb{I} \times \sum_{1 \leq i < j \leq \ell} \mathfrak{E}_{j-i}^{e_i} | \mathfrak{U} \mathbb{I} \times \sum_{0 \leq i \leq j \leq \ell} \mathfrak{E}_{j+i}^{e_j} | \mathfrak{U} \mathbb{I} \\ \mathfrak{E}_-^{u_\ell - e} | \mathfrak{U} \mathbb{I} &= \mathbb{K} \frac{e_k - \check{e}_k}{k \leq \ell} \end{aligned}$$

$$(u_\ell - e) \delta = - \sum_{k > \ell} e_k \delta = 0$$

$$(u_\ell - e) X_{e_k}^- = e_k - (u_\ell - e) \check{e}_k (u_\ell - e) = \begin{cases} e_k & k \leq \ell \\ 0 & k > \ell \end{cases}$$

$$(u_\ell - e) \overline{X_a^- + \varkappa | \{i:j\} | \check{a} e_j - \check{e}_j a} = a - (u_\ell - e) \check{a} (u_\ell - e) + \varepsilon i \# j \left((u_\ell - e) \check{a} e_j - (u_\ell - e) \check{e}_j a \right) =$$

$$\begin{cases} a - \check{a} + 2\varkappa(-\check{a}/2 + a/2) = (1 + \varkappa)(1 - \varepsilon)a & \ell < i < j \\ a - \check{a} + \varkappa(-\check{a} + a) = (1 + \varkappa)(1 - \varepsilon)a & \ell < i = j \\ a + 2\varkappa a/2 = (1 + \varkappa)a & 0 \leq i \leq \ell < j \\ a & 0 \leq i \leq j \leq \ell \end{cases}$$

$$A = \sum_k \lambda^k X_{e_k}^- \Rightarrow \underbrace{\varkappa}_{\mathcal{H}} A = a(r - \ell) \underbrace{\lambda^1 + \dots + \lambda^\ell}_{\mathcal{H}} - a \underbrace{\lambda^{\ell+1} + \dots + \lambda^r}_{\mathcal{H}}$$

$$\underbrace{\varkappa}_{\mathcal{H}} \sum_k \lambda^k X_{e_k}^- = \sum_k \lambda^k \underbrace{\varkappa}_{\mathcal{H}} X_{e_k}^- = \sum_{\ell < i < j} a \underbrace{\lambda^j - \lambda^i}_{\mathcal{H}} + \sum_{i < j > \ell} a \underbrace{\lambda^i - \lambda^j}_{\mathcal{H}}$$

$$= a \sum_{i \leq \ell < j} \underbrace{\lambda^i - \lambda^j}_{\mathcal{H}} = a(r - \ell) \underbrace{\lambda^1 + \dots + \lambda^\ell}_{\mathcal{H}} - a \underbrace{\lambda^{\ell+1} + \dots + \lambda^r}_{\mathcal{H}}$$

$$\dot{A} = \sum_{k > \ell} \lambda^k X_{e_k}^- \Rightarrow \underbrace{\varkappa}_{\mathcal{H}} \dot{A} = -a \underbrace{\lambda^{\ell+1} + \dots + \lambda^r}_{\mathcal{H}}$$

$$A = \sum_k \lambda^k X_{e_k}^- \Rightarrow \underline{\mathfrak{K}_{\mathcal{H}} A} = \frac{2n}{r} \underline{\lambda^1 + \dots + \lambda^\ell} - a\ell \underline{\lambda^{\ell+1} + \dots + \lambda^r}$$

$$\begin{aligned} \underline{\mathfrak{K}_{\mathcal{H}} A} - \underline{\mathfrak{K}'_{\mathcal{H}} A} &= \sum_{1 \leq i < j \leq \ell} \left(a \underline{\lambda^j - \lambda^i} + a \underline{\lambda^i - \lambda^j} \right) + \sum_{i < j \leq \ell} a \underline{\lambda^j + \lambda^i} + \sum_{j \leq \ell} \underline{2\lambda^j + 2b\lambda^j} \\ &= \sum_{i < j \leq \ell} a \underline{\lambda^j + \lambda^i} + \sum_{j \leq \ell} 2(1+b) \lambda^j = a \begin{bmatrix} \lambda^2 + \lambda^1 + \lambda^3 + \lambda^1 + \dots + \lambda^\ell + \lambda^1 \\ \lambda^3 + \lambda^2 + \dots + \lambda^\ell + \lambda^2 \\ \lambda^\ell + \lambda^{\ell-1} \end{bmatrix} + 2(1+b) \underline{\lambda^1 + \dots + \lambda^\ell} = \\ &= a(\ell-1) \underline{\lambda^1 + \dots + \lambda^\ell} + 2(1+b) \underline{\lambda^1 + \dots + \lambda^\ell} = (a(\ell-1) + 2(1+b)) \underline{\lambda^1 + \dots + \lambda^\ell} \end{aligned}$$