

$$= \langle \theta_{\alpha i}^* e_i^*, e_\beta \rangle + \langle e_\alpha^*, \theta_{\beta j} e_j \rangle$$

$$= \theta_{\alpha\beta}^* + \bar{\theta}_{\beta\alpha} = 0,$$

$$\Rightarrow \theta_{\alpha\beta}^* = -\bar{\theta}_{\beta\alpha}.$$

$$\Rightarrow D\Theta = -d(\theta \wedge \theta)_{ij} e_i^* \otimes e_j - (d\theta - \theta \wedge \theta)_{ij} \wedge (\theta_{i\alpha}^* e_\alpha^* \otimes e_\beta + e_i^* \otimes \theta_{j\beta} e_\beta)$$

$$= -d(\theta \wedge \theta)_{ij} e_i^* \otimes e_j + (d\theta - \theta \wedge \theta)_{ij} \wedge \bar{\theta}_{\alpha i} e_\alpha^* \otimes e_\beta$$

$$- (d\theta - \theta \wedge \theta)_{ij} \wedge \theta_{j\beta} \otimes e_i^* \otimes e_\beta.$$

$$d(\theta_{i\alpha} \wedge \theta_{\alpha j}) = d\theta_{i\alpha} \wedge \theta_{\alpha j} - \theta_{i\alpha} \wedge d\theta_{\alpha j}$$

$$= (d\theta \wedge \theta)_{ij} - (\theta \wedge d\theta)_{ij}$$

$$= (d\theta \wedge \theta - \theta \wedge d\theta)_{ij}$$

Since we can make θ vanish at any point p ,
 $\theta(p) = 0$, and $D\Theta(p) = 0$.

$A_i \in A^{d_i}(\text{Hom}(E, E))$. as above, $\{e_i\}$ orthonormal frame
 $\{e_i^*\}$ dual.

$$\Rightarrow A_i = a_{\alpha\beta}^i e_\alpha^* \otimes e_\beta, \quad a_{\alpha\beta}^i \text{ } d_i\text{-form.}$$

$$\Rightarrow DA_i = da_{\alpha\beta}^i \otimes e_\alpha^* \otimes e_\beta + (-1)^{d_i} a_{\alpha\beta}^i \wedge D(e_\alpha^* \otimes e_\beta)$$

$$= da_{\alpha\beta}^i \otimes e_\alpha^* \otimes e_\beta + (-1)^{d_i} a_{\alpha\beta}^i \wedge (-\bar{\theta}_{\kappa\alpha} e_\kappa^* \otimes e_\beta + e_\alpha^* \otimes \theta_{\beta\lambda} e_\lambda)$$

$$= da_{\alpha\beta}^i \otimes e_\alpha^* \otimes e_\beta + (-1)^{d_i} a_{\alpha\beta}^i \wedge (-\bar{\theta}_{\alpha\kappa}) e_\kappa^* \otimes e_\beta + (-1)^{d_i} a_{\alpha\beta}^i \otimes \theta_{\beta\lambda} e_\lambda$$

$$\theta_{\beta\lambda} e_\lambda^* \otimes e_\beta$$

$$= (da_{\alpha\beta}^i + (-1)^{d_i} (-1) \bar{\theta}_{\alpha\kappa} a_{\kappa\beta}^i + (-1)^{d_i} a_{\alpha\lambda}^i \theta_{\beta\lambda}) \otimes e_\alpha^* \otimes e_\beta$$