Asociované vekt. bundly

gM bundl Lieovy alg

AM vekt. bundl SO-bundl

$t_\kappa{}^A{}_B$ gen repr

$$m\in g \to M^A{}_B = t_m{}^A{}_B = m^\kappa t_\kappa{}^A{}_B$$

$$t_{[m,n]} = [t_m, t_n]$$

$$C_{\mu\nu}{}^\kappa t_\kappa{}^A{}_B = t_\mu{}^A{}_C t_\nu{}^C{}_B - t_\nu{}^A{}_C t_\mu{}^C{}_B$$

$$(T_m\phi, T_m\psi) = (\phi,\psi) \qquad H_{AB}$$

$$t_m^T = -t_m$$

$$t_{\kappa AB} + t_{\kappa BA} = 0$$

rozšíření kov. der

z gM na AM

D na gM $\quad Dc=0$

D na AM $\quad DH=0$

$$D_m t_\kappa{}^A{}_B = 0$$

trivializace

e_α $\quad c_{\alpha\beta}{}^\gamma$ = konst $\quad \partial c = 0$

E_A $\quad H_{AB}$ = konst $\quad \partial H = 0$

$t_\mu{}^A{}_B$ = konst $\quad \partial t = 0$

$$\partial e_\alpha = 0,\ \partial E_A = 0$$

$$D_n m^\kappa = \partial_n m^\kappa + [\Omega_n, m]^\kappa \qquad A_m{}^\alpha{}_\beta = \Omega_m^\kappa c_{\kappa\beta}{}^\alpha$$

$$D_n\phi^A = \partial_n\phi^A + A_n{}^A{}_B\phi^B$$

$$\underbrace{D_m t_\kappa{}^A{}_B}_{0} = \underbrace{\partial_m t_\kappa{}^A{}_B}_{0} - \Omega_m^\lambda c_{\lambda\kappa}{}^\nu t_\nu{}^A{}_B + [A_m, t_\kappa]^A{}_B$$

$$-\Omega_m^\lambda [t_\lambda, t_\kappa]^A{}_B + [A_m, t_\kappa]^A{}_B = 0$$

$$[A_m - \Omega_m^\lambda t_\lambda, t_\kappa]^A{}_B = 0$$

$$A_m{}^A{}_B - \Omega_m^\lambda t_\lambda{}^A{}_B = \sum_\varrho a_\varrho P_\varrho{}^A{}_B$$

$$A^T = -A \qquad t_m^T = -t_m \qquad P_\varrho^T = P_\varrho$$

$$\Rightarrow a_\varrho = 0 \qquad A_\mu{}^A{}_B = \Omega_\mu^\lambda t_\lambda{}^A{}_B$$

Asociované vekt. bundly

$\mathfrak{g}M$ bundle Lieovy alg

AM vekt. bundle SO-bundle

$t_{\underline{\kappa}}{}^{\underline{A}}{}_{\underline{B}}$ gen repr.

$$m \in \mathfrak{g} \to M^{\underline{A}}{}_{\underline{B}} = t_{m}{}^{\underline{A}}{}_{\underline{B}} = m^{\underline{\kappa}} t_{\underline{\kappa}}{}^{\underline{A}}{}_{\underline{B}}$$

$$t_{[m,n]} = [t_m, t_n]$$

$$C_{\underline{\mu\nu}}{}^{\underline{\kappa}} t_{\underline{\kappa}}{}^{\underline{A}}{}_{\underline{B}} = t_{\underline{\mu}}{}^{\underline{A}}{}_{\underline{C}} t_{\underline{\nu}}{}^{\underline{C}}{}_{\underline{B}} - t_{\underline{\nu}}{}^{\underline{A}}{}_{\underline{C}} t_{\underline{\mu}}{}^{\underline{C}}{}_{\underline{B}}$$

$$(T_m \cdot \phi, T_m \cdot \psi) = (\phi, \psi) \qquad H_{\underline{AB}}$$

$$t_m{}^T = -t_m$$

$$t_{\underline{\kappa}\,\underline{AB}} + t_{\underline{\kappa}\,\underline{BA}} = 0$$

rozšíření kov. der

z gM na AM

D na gM $\qquad Dc = 0$

D na AM $\qquad DH = 0$

$$D_{\underline{m}} t_{\underline{k}}{}^{\underline{A}}{}_{\underline{B}} = 0$$

trivializace

e_α $\quad C_{\alpha\beta}{}^{\gamma} = \text{konst} \quad \partial c = 0$

E_A $\quad H_{AB} = \text{konst} \quad \partial H = 0$

$t_{\mu}{}^{A}{}_{B} = \text{konst} \quad \partial t = 0$

$\partial e_\alpha = 0 \quad \partial E_A = 0$

$$\mathcal{D}_{\underline{m}} m^{\underline{\kappa}} = \partial_{\underline{m}} m^{\underline{\kappa}} + [\Omega_{\underline{m}}, m]^{\underline{\kappa}} \qquad A_{\underline{m}}{}^{\underline{\alpha}}{}_{\underline{\beta}} = \Omega_{\underline{m}}^{\underline{\kappa}} C_{\underline{\kappa}\underline{\beta}}{}^{\underline{\alpha}}$$

$$D_{\underline{m}} \phi^{\underline{A}} = \partial_{\underline{m}} \phi^{\underline{A}} + A_{\underline{m}}{}^{\underline{A}}{}_{\underline{B}} \phi^{\underline{B}}$$

$$\underbrace{D_{\underline{m}} t_{\underline{\kappa}}{}^{\underline{A}}{}_{\underline{B}}}_{0} = \underbrace{\partial_{\underline{m}} t_{\underline{\kappa}}{}^{\underline{A}}{}_{\underline{B}}}_{0} - \Omega_{\underline{m}}^{\underline{\lambda}} C_{\underline{\lambda}\underline{\kappa}}{}^{\underline{\nu}} t_{\underline{\nu}}{}^{\underline{A}}{}_{\underline{B}}$$
$$+ [A_{\underline{m}}, t_{\underline{\kappa}}]^{\underline{A}}{}_{\underline{B}}$$

$$-\Omega_{\underline{m}}^{\underline{\lambda}} [t_{\underline{\lambda}}, t_{\underline{\kappa}}]^{\underline{A}}{}_{\underline{B}} + [A_{\underline{m}}, t_{\underline{\kappa}}]^{\underline{A}}{}_{\underline{B}} = 0$$

$$[A_{\underline{m}} - \Omega_{\underline{m}}^{\underline{\lambda}} t_{\underline{\lambda}}, t_{\underline{\kappa}}]^{\underline{A}}{}_{\underline{B}} = 0$$

$$A_{\underline{m}}{}^{\underline{A}}{}_{\underline{B}} - \Omega_{\underline{m}}^{\lambda} t_{\lambda}{}^{\underline{A}}{}_{\underline{B}} = \sum_{\ell} a_{\ell} P_{\ell}{}^{\underline{A}}{}_{\underline{B}}$$

$$A^T = -A \qquad t_m^{\dagger} = -t_m \qquad P_\ell^T = P_\ell$$

$$\Rightarrow a_\ell = 0 \qquad A_{\underline{m}}{}^{\underline{A}}{}_{\underline{B}} = \Omega_{\underline{m}}^{\lambda} t_{\lambda}{}^{\underline{A}}{}_{\underline{B}}$$