$D = 11$ Sugra bose Lagrangian

$$3 \ddagger \frac{2}{5}$$

$$\begin{cases} e_{\mu}^{m} & \text{vielbein } 44 \\ \lambda_{\mu\nu} \not{3} & \text{3 potential } 84 \\ \mu \not{I} & \text{Majorana gravitino } 2^7 = 128 \end{cases}$$

$$d^{11} x \sqrt{-G} \left(R - \frac{1}{48} \overset{2}{\overset{\sqcap}{\not{3}}} \right) + \frac{\sqrt{2}}{2^7 3^2} \not{3} \not{3}^2$$

$$2 \left(* R_{11} - \mathcal{L}_{11} \right) = \overset{2}{\overset{\sqcap}{\not{3}}} + \frac{1}{3} \overset{2}{\not{3}} \not{3}$$

$$SO_{1:10}$$

$$N = 1 \text{ SUSY } Q_{\alpha}$$

$$E_8^8 = 1$$

$$* \not{3} + \frac{1}{2} \overset{2}{\not{3}} = 0$$

$$2 \lrcorner_{c}^{\mu} \ \lrcorner_{\mu b}^{a} \eta_{ae} = \underbrace{\lrcorner_{c}^{\mu} \lrcorner_{e}^{\nu} - \lrcorner_{e}^{\mu} \lrcorner_{c}^{\nu}}_{\mu} \lrcorner_{\nu}^{f} \eta_{fb} - \eta_{cf} \underbrace{\lrcorner_{e}^{\mu} \lrcorner_{b}^{\nu} - \lrcorner_{b}^{\mu} \lrcorner_{e}^{\nu}}_{\mu} \lrcorner_{\nu}^{f} + \underbrace{\lrcorner_{b}^{\mu} \lrcorner_{c}^{\nu} - \lrcorner_{c}^{\mu} \lrcorner_{b}^{\nu}}_{\mu} \lrcorner_{\nu}^{a} \eta_{ae}$$

bosonic

$$V = \det V_{M}^{A}$$

$$F_{ABCD} = \partial_{A} V_{BCD} - \partial_{D} V_{BCA} + 3 \omega_{AB}^{E} V_{CDE} - 3 \omega_{CD}^{E} V_{ABE}$$

$$\partial_{A} = V_{A}^{M} \partial_{M}$$

$$R_{BMN}^{A} = \partial_{M} \omega_{NB}^{A} + \omega_{ME}^{A} \omega_{NB}^{E} - \partial_{N} \omega_{MB}^{A} - \omega_{NE}^{A} \omega_{MB}^{E}$$

$$R = V_{A}^{M} V_{C}^{N} R_{BMN}^{A} \eta^{BC} = \omega_{ABC} \omega^{CAB} - 2 V^{-1} \partial_{M} \left(V V_{A}^{M} \omega^{A} \right)$$

$$VR$$

$$V F_{ABCD} F^{ABCD}$$

$$\varepsilon^{A_0 \cdots A_{10}} F_{A_0 \cdots A_3} F_{A_4 \cdots A_7} V_{A_8 \cdots A_{10}}$$

motion

$$M \in 11$$

$$\psi_{_M} = 0$$

$$R_{_{MN}} - \frac{1}{2}\, g_{_{MN}} R = \frac{1}{3}\, F_{_{MPQR}}\, F_{_N}^{^{PQR}} - \frac{1}{24}\, g_{_{MN}}\, F_{_{PQRS}}\, F^{^{PQRS}}$$

$$\mathfrak{d}_{_M}\, F^{^{MM_8M_9M_{10}}} = -\frac{1}{576}\, \varepsilon^{^{M_0\cdots M_7M_8M_9M_{10}}}\, F_{_{M_0\cdot\cdot M_3}}\, F_{_{M_4\cdot\cdot M_7}}$$

DUF 50