Sign Conventions

- Spinor products as in Wess & Bagger:
  $\psi\chi = \psi^\alpha\chi_\alpha = \epsilon_{\alpha\beta}\psi^\alpha\chi^\beta = -\psi_\alpha\chi^\alpha$;
  $\overline{\psi}\overline{\chi} = \overline{\psi}_{\dot\alpha}\overline{\chi}^{\dot\alpha} = \epsilon^{\dot\alpha\dot\beta}\overline{\psi}_{\dot\alpha}\overline{\chi}_{\dot\beta} = -\overline{\psi}^{\dot\alpha}\overline{\chi}_{\dot\alpha}$.
  Note that for fermions $\psi^\alpha\chi_\alpha = +\chi^\alpha\psi_\alpha$ and $\overline{\psi}_{\dot\alpha}\overline{\chi}^{\dot\alpha} = +\overline{\chi}_{\dot\alpha}\overline{\psi}^{\dot\alpha}$.
- Signature $(+,-,-,-)$ as in Peskin & Schroeder.
- Sigma matrices $\sigma^\mu = (1,\vec{\sigma})$ and $\bar\sigma^\mu = (1,-\vec{\sigma})$ as in Peskin & Schroeder.
  Note $\bar\sigma^{\mu\,\dot\alpha\alpha} = \epsilon^{\alpha\beta}\epsilon^{\dot\alpha\dot\beta}\sigma^\mu_{\beta\dot\beta}$ and $\sigma^\mu_{\alpha\dot\alpha} = \epsilon_{\alpha\beta}\epsilon_{\dot\alpha\dot\beta}\bar\sigma^{\mu\,\dot\beta\beta}$;
  also $\mathrm{tr}(\sigma^\mu\bar\sigma^\nu) = +2g^{\mu\nu}$ and $(\theta\sigma^\mu\bar\theta)\times(\theta\sigma^\nu\bar\theta) = +\frac{1}{2}\theta^2\bar\theta^2 g^{\mu\nu}$.
- Anticommutation relations $\{D_\alpha, \overline{D}_{\dot\alpha}\} = +2i\sigma^\mu_{\alpha\dot\alpha}\partial_\mu$ and $\{D^\alpha, \overline{D}^{\dot\alpha}\} = +2i\bar\sigma^{\mu\,\dot\alpha\alpha}\partial_\mu$.
- Projector operators:

$$\begin{aligned}
\text{chiral} \quad \Pi_C &= \frac{-1}{16\partial^2}\,\overline{D}^2 D^2,\\
\text{antichiral} \quad \Pi_A &= \frac{-1}{16\partial^2}\,D^2\overline{D}^2,\\
\text{linear} \quad \Pi_L &= \frac{+1}{8\partial^2}\,D^\alpha\overline{D}^2 D_\alpha.
\end{aligned}$$

- Abelian vector field:

$$\mathcal{L} \;=\; +\frac{1}{8}\int d^4\theta\, V D^\alpha \overline{D}^2 D_\alpha V \;=\; +\frac{1}{2}\int d^2\theta\, W^\alpha W_\alpha \;=\; +\frac{1}{2}\int d^2\bar\theta\, \overline{W}_{\dot\alpha}\overline{W}^{\dot\alpha}.$$

  In the Wess-Zumino gauge

$$V(x,\theta,\bar\theta) \;=\; +(\theta\sigma^\mu\bar\theta)\,A_\mu(x) \;+\; \bar\theta^2\,\theta\lambda(x) \;+\; \theta^2\,\bar\theta\bar\lambda(x) \;+\; \tfrac{1}{2}\theta^2\bar\theta^2\,\mathcal{D}(x).$$

  In any gauge

$$W_\alpha(y,\theta) \;=\; \lambda_\alpha(y) \;+\; \theta_\alpha\mathcal{D}(y) \;+\; \tfrac{i}{2}(\sigma^\mu\bar\sigma^\nu)_\alpha^{\ \beta}\theta_\beta F_{\mu\nu}(y) \;+\; i\theta^2\sigma^\mu_{\alpha\dot\alpha}\partial_\mu\bar\lambda^{\dot\alpha}(y).$$