

Pöscherskij 2.2

$$= X^{\mu_1} X^{\mu_2} X^{\mu_3} X^{\mu_4} :$$

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$$+ \frac{1}{2} d' \left[\eta^{\mu_1 \mu_2} \ln |z_{12}|^2 X^{\mu_3} X^{\mu_4} \right. \\ + \eta^{\mu_1 \mu_3} \ln |z_{13}|^2 X^{\mu_2} X^{\mu_4} \\ + \eta^{\mu_1 \mu_4} \ln |z_{14}|^2 X^{\mu_2} X^{\mu_3} \\ + \eta^{\mu_2 \mu_3} \ln |z_{23}|^2 X^{\mu_1} X^{\mu_4} \\ + \eta^{\mu_2 \mu_4} \ln |z_{24}|^2 X^{\mu_1} X^{\mu_3} \\ \left. + \eta^{\mu_3 \mu_4} \ln |z_{34}|^2 X^{\mu_1} X^{\mu_2} \right]$$

Apply $(\partial, \bar{\partial})$:

$$\Rightarrow (\partial, \bar{\partial}, X^{\mu_1}) X^{\mu_2} X^{\mu_3} X^{\mu_4}$$

$$+ \frac{1}{2} d' \left[\eta^{\mu_2 \mu_3} \ln |z_{23}|^2 X^{\mu_4} (\partial, \bar{\partial}, X^{\mu_1}) \right.$$

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$$\left. + \eta^{\mu_3 \mu_4} \ln |z_{34}|^2 X^{\mu_2} (\partial, \bar{\partial}, X^{\mu_1}) \right]$$

$$= (\partial, \bar{\partial}, X^{\mu_1}) : X^{\mu_2} X^{\mu_3} X^{\mu_4} :$$

$$= (\partial, \bar{\partial}, :X^{\mu_1}:) (:X^{\mu_2} X^{\mu_3} X^{\mu_4}:)$$

$$= \boxed{0}$$

Davideh

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