

Schritt 8.5 (a).

$$R = \frac{1}{2} (h_{\alpha\nu, \beta\mu} + h_{\beta\mu, \alpha\nu} - h_{\alpha\mu, \beta\nu} - h_{\beta\nu, \alpha\mu}).$$

$$h_{\alpha\beta} = \xi_{\alpha, \beta} + \xi_{\beta, \alpha}.$$

$$\Rightarrow R \sim \begin{bmatrix} \xi_{\alpha, \nu\beta\mu} + \xi_{\nu, \alpha\beta\mu} + \xi_{\beta, \mu\alpha\nu} + \xi_{\mu, \beta\alpha\nu} \\ -\xi_{\alpha, \mu\beta\nu} - \xi_{\mu, \alpha\beta\nu} - \xi_{\beta, \nu\alpha\mu} - \xi_{\nu, \beta\alpha\mu} \end{bmatrix} = \boxed{0}.$$



The corresponding canceling terms
are indicated by the arrows.

da) According to ~~(8.24)~~ (8.25), under gauge trans, $h_{\alpha\beta} \rightarrow h_{\alpha\beta} - (\xi_{\alpha, \beta} + \xi_{\beta, \alpha})$.

$$\Rightarrow \delta R \sim -(\delta_{\alpha\nu, \beta\mu} + \delta_{\beta\mu, \alpha\nu} - \delta_{\alpha\mu, \beta\nu} - \delta_{\beta\nu, \alpha\mu}),$$

$$\text{where } \delta_{\alpha\nu} = \xi_{\alpha, \nu} + \xi_{\nu, \alpha}$$

$$\Rightarrow \boxed{\delta R = 0} \quad \text{according to part (a).}$$

Note we introduced δ which is equivalent to h in part (a)
to avoid confusion.

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