

# Covariant SVT

## Metric

$$h_{\theta\theta} = -2\phi$$

$$h_{\theta i} = \nabla_i B + B_i$$

$$h_{ij} = -2\psi + 2\nabla_i \nabla_j E + \nabla_i E_j + \nabla_j E_i + 2E_{ij}$$

## Conditions

$$\nabla_i B^i = \nabla_i E^i = 0$$

$$\nabla_i E^{ij} = 0$$

$$g_{ij} E^{ij} = 0$$

## Laplacian

$$\nabla^2 = \nabla_i \nabla^i$$

$$\delta G_{\mu\nu} \Omega = 1$$

00	$(-2 \nabla^2 \psi) + (\theta) + (\theta)$
11	$(-g_{11} \nabla^2 \phi + g_{11} \nabla^2 \psi - g_{11} \nabla^2 \nabla_\theta B + g_{11} \nabla^2 \nabla_\theta \nabla_\theta E - 2 g_{11} \nabla_\theta \nabla_\theta \psi + \nabla_1 \nabla_1 \phi - \nabla_1 \nabla_1 \psi + \nabla_1 \nabla_1 \nabla_\theta B - \nabla_1 \nabla_1 \nabla_\theta \nabla_\theta E) + (\nabla_1 \nabla_\theta B_1 - \nabla_1 \nabla_\theta \nabla_\theta E_1) + (\nabla^2 E_{11} - \nabla_\theta \nabla_\theta E_{11})$
22	$(-g_{22} \nabla^2 \phi + g_{22} \nabla^2 \psi - g_{22} \nabla^2 \nabla_\theta B + g_{22} \nabla^2 \nabla_\theta \nabla_\theta E - 2 g_{22} \nabla_\theta \nabla_\theta \psi + \nabla_2 \nabla_2 \phi - \nabla_2 \nabla_2 \psi + \nabla_2 \nabla_2 \nabla_\theta B - \nabla_2 \nabla_2 \nabla_\theta \nabla_\theta E) + (\nabla_2 \nabla_\theta B_2 - \nabla_2 \nabla_\theta \nabla_\theta E_2) + (\nabla^2 E_{22} - \nabla_\theta \nabla_\theta E_{22})$
33	$(-g_{33} \nabla^2 \phi + g_{33} \nabla^2 \psi - g_{33} \nabla^2 \nabla_\theta B + g_{33} \nabla^2 \nabla_\theta \nabla_\theta E - 2 g_{33} \nabla_\theta \nabla_\theta \psi + \nabla_3 \nabla_3 \phi - \nabla_3 \nabla_3 \psi + \nabla_3 \nabla_3 \nabla_\theta B - \nabla_3 \nabla_3 \nabla_\theta \nabla_\theta E) + (\nabla_3 \nabla_\theta B_3 - \nabla_3 \nabla_\theta \nabla_\theta E_3) + (\nabla^2 E_{33} - \nabla_\theta \nabla_\theta E_{33})$
01	$(-2 \nabla_1 \nabla_\theta \psi) + (\frac{\nabla^2 B_1}{2} - \frac{1}{2} \nabla^2 \nabla_\theta E_1) + (\theta)$
02	$(-2 \nabla_2 \nabla_\theta \psi) + (\frac{\nabla^2 B_2}{2} - \frac{1}{2} \nabla^2 \nabla_\theta E_2) + (\theta)$
03	$(-2 \nabla_3 \nabla_\theta \psi) + (\frac{\nabla^2 B_3}{2} - \frac{1}{2} \nabla^2 \nabla_\theta E_3) + (\theta)$
12	$(\nabla_2 \nabla_1 \phi - \nabla_2 \nabla_1 \psi + \nabla_2 \nabla_1 \nabla_\theta B - \nabla_2 \nabla_1 \nabla_\theta \nabla_\theta E) + (\frac{1}{2} \nabla_1 \nabla_\theta B_2 - \frac{1}{2} \nabla_1 \nabla_\theta \nabla_\theta E_2 + \frac{1}{2} \nabla_2 \nabla_\theta B_1 - \frac{1}{2} \nabla_2 \nabla_\theta \nabla_\theta E_1) + (\nabla^2 E_{12} - \nabla_\theta \nabla_\theta E_{12})$
13	$(\nabla_3 \nabla_1 \phi - \nabla_3 \nabla_1 \psi + \nabla_3 \nabla_1 \nabla_\theta B - \nabla_3 \nabla_1 \nabla_\theta \nabla_\theta E) + (\frac{1}{2} \nabla_1 \nabla_\theta B_3 - \frac{1}{2} \nabla_1 \nabla_\theta \nabla_\theta E_3 + \frac{1}{2} \nabla_3 \nabla_\theta B_1 - \frac{1}{2} \nabla_3 \nabla_\theta \nabla_\theta E_1) + (\nabla^2 E_{13} - \nabla_\theta \nabla_\theta E_{13})$
23	$(\nabla_3 \nabla_2 \phi - \nabla_3 \nabla_2 \psi + \nabla_3 \nabla_2 \nabla_\theta B - \nabla_3 \nabla_2 \nabla_\theta \nabla_\theta E) + (\frac{1}{2} \nabla_2 \nabla_\theta B_3 - \frac{1}{2} \nabla_2 \nabla_\theta \nabla_\theta E_3 + \frac{1}{2} \nabla_3 \nabla_\theta B_2 - \frac{1}{2} \nabla_3 \nabla_\theta \nabla_\theta E_2) + (\nabla^2 E_{23} - \nabla_\theta \nabla_\theta E_{23})$

$$\delta G_{\mu\nu} \Omega = \Omega[t]$$

00	$(-2 \nabla^2 \psi + \frac{2 \nabla^2 B \Omega'[t]}{\Omega[t]} - \frac{2 \nabla^2 \nabla_\theta E \Omega'[t]}{\Omega[t]} + \frac{6 \nabla_\theta \psi \Omega'[t]}{\Omega[t]}) + (\theta) + (\theta)$
11	$(-g_{11} \nabla^2 \phi + g_{11} \nabla^2 \psi - g_{11} \nabla^2 \nabla_\theta B + g_{11} \nabla^2 \nabla_\theta \nabla_\theta E - 2 g_{11} \nabla_\theta \nabla_\theta \psi + \nabla_1 \nabla_1 \phi - \nabla_1 \nabla_1 \psi + \nabla_1 \nabla_1 \nabla_\theta B - \nabla_1 \nabla_1 \nabla_\theta \nabla_\theta E - \frac{2 g_{11} \nabla^2 B \Omega'[t]}{\Omega[t]} + \frac{2 g_{11} \nabla^2 \nabla_\theta E \Omega'[t]}{\Omega[t]} - \frac{2 g_{11} \nabla_\theta \phi \Omega'[t]}{\Omega[t]} - \frac{4 g_{11} \nabla_\theta \psi \Omega'[t]}{\Omega[t]} + \frac{2 \nabla_1 \nabla_1 B \Omega'[t]}{\Omega[t]} - \frac{2 \nabla_1 \nabla_1 \nabla_\theta E \Omega'[t]}{\Omega[t]} + \frac{2 g_{11} \phi \Omega'[t]^2}{\Omega[t]^2} + \frac{2 g_{11} \psi \Omega'[t]^2}{\Omega[t]^2} - \frac{2 \nabla_1 \nabla_1 E \Omega'[t]^2}{\Omega[t]^2} - \frac{4 g_{11} \phi \Omega''[t]}{\Omega[t]} - \frac{4 g_{11} \psi \Omega''[t]}{\Omega[t]} + \frac{4 \nabla_1 \nabla_1 E \Omega''[t]}{\Omega[t]}) + (\nabla_1 \nabla_\theta B_1 - \nabla_1 \nabla_\theta \nabla_\theta E_1 + \frac{2 \nabla_1 B_1 \Omega'[t]}{\Omega[t]} - \frac{2 \nabla_1 \nabla_\theta E_1 \Omega'[t]}{\Omega[t]} - \frac{2 \nabla_1 E_1 \Omega'[t]^2}{\Omega[t]^2} + \frac{4 \nabla_1 E_1 \Omega''[t]}{\Omega[t]}) + (\nabla^2 E_{11} - \nabla_\theta \nabla_\theta E_{11} + \frac{2 \nabla_\theta E_{11} \Omega'[t]}{\Omega[t]} - \frac{2 \nabla_\theta \nabla_\theta E_{11} \Omega'[t]^2}{\Omega[t]^2} - \frac{4 \nabla_\theta E_{11} \Omega''[t]}{\Omega[t]})$

22	$ \begin{aligned} & (-g_{22} \nabla^2 \phi + g_{22} \nabla^2 \psi - g_{22} \nabla^2 \nabla_0 B + g_{22} \nabla^2 \nabla_0 \nabla_0 E - 2 g_{22} \nabla_0 \nabla_0 \psi + \nabla_2 \nabla_2 \phi - \nabla_2 \nabla_2 \psi + \nabla_2 \nabla_2 \nabla_0 B - \\ & \nabla_2 \nabla_2 \nabla_0 \nabla_0 E - \frac{2 g_{22} \nabla^2 B \Omega'[t]}{\Omega[t]} + \frac{2 g_{22} \nabla^2 \nabla_0 E \Omega'[t]}{\Omega[t]} - \frac{2 g_{22} \nabla_0 \phi \Omega'[t]}{\Omega[t]} - \frac{4 g_{22} \nabla_0 \psi \Omega'[t]}{\Omega[t]} + \frac{2 \nabla_2 \nabla_2 B \Omega'[t]}{\Omega[t]} - \\ & \frac{2 \nabla_2 \nabla_2 \nabla_0 E \Omega'[t]}{\Omega[t]} + \frac{2 g_{22} \phi \Omega'[t]^2}{\Omega[t]^2} + \frac{2 g_{22} \psi \Omega'[t]^2}{\Omega[t]^2} - \frac{2 \nabla_2 \nabla_2 E \Omega'[t]^2}{\Omega[t]^2} - \frac{4 g_{22} \phi \Omega''[t]}{\Omega[t]} - \frac{4 g_{22} \psi \Omega''[t]}{\Omega[t]} + \frac{4 \nabla_2 \nabla_2 E \Omega''[t]}{\Omega[t]} \\ & ) + ( \nabla_2 \nabla_0 B_2 - \nabla_2 \nabla_0 \nabla_0 E_2 + \frac{2 \nabla_2 B_2 \Omega'[t]}{\Omega[t]} - \frac{2 \nabla_2 \nabla_0 E_2 \Omega'[t]}{\Omega[t]} - \frac{2 \nabla_2 E_2 \Omega'[t]^2}{\Omega[t]^2} + \frac{4 \nabla_2 E_2 \Omega''[t]}{\Omega[t]} \\ & ) + ( \nabla^2 E_{22} - \nabla_0 \nabla_0 E_{22} - \frac{2 \nabla_0 E_{22} \Omega'[t]}{\Omega[t]} - \frac{2 E_{22} \Omega'[t]^2}{\Omega[t]^2} + \frac{4 E_{22} \Omega''[t]}{\Omega[t]} ) \end{aligned} $
33	$ \begin{aligned} & (-g_{33} \nabla^2 \phi + g_{33} \nabla^2 \psi - g_{33} \nabla^2 \nabla_0 B + g_{33} \nabla^2 \nabla_0 \nabla_0 E - 2 g_{33} \nabla_0 \nabla_0 \psi + \nabla_3 \nabla_3 \phi - \nabla_3 \nabla_3 \psi + \nabla_3 \nabla_3 \nabla_0 B - \\ & \nabla_3 \nabla_3 \nabla_0 \nabla_0 E - \frac{2 g_{33} \nabla^2 B \Omega'[t]}{\Omega[t]} + \frac{2 g_{33} \nabla^2 \nabla_0 E \Omega'[t]}{\Omega[t]} - \frac{2 g_{33} \nabla_0 \phi \Omega'[t]}{\Omega[t]} - \frac{4 g_{33} \nabla_0 \psi \Omega'[t]}{\Omega[t]} + \frac{2 \nabla_3 \nabla_3 B \Omega'[t]}{\Omega[t]} - \\ & \frac{2 \nabla_3 \nabla_3 \nabla_0 E \Omega'[t]}{\Omega[t]} + \frac{2 g_{33} \phi \Omega'[t]^2}{\Omega[t]^2} + \frac{2 g_{33} \psi \Omega'[t]^2}{\Omega[t]^2} - \frac{2 \nabla_3 \nabla_3 E \Omega'[t]^2}{\Omega[t]^2} - \frac{4 g_{33} \phi \Omega''[t]}{\Omega[t]} - \frac{4 g_{33} \psi \Omega''[t]}{\Omega[t]} + \frac{4 \nabla_3 \nabla_3 E \Omega''[t]}{\Omega[t]} \\ & ) + ( \nabla_3 \nabla_0 B_3 - \nabla_3 \nabla_0 \nabla_0 E_3 + \frac{2 \nabla_3 B_3 \Omega'[t]}{\Omega[t]} - \frac{2 \nabla_3 \nabla_0 E_3 \Omega'[t]}{\Omega[t]} - \frac{2 \nabla_3 E_3 \Omega'[t]^2}{\Omega[t]^2} + \frac{4 \nabla_3 E_3 \Omega''[t]}{\Omega[t]} \\ & ) + ( \nabla^2 E_{33} - \nabla_0 \nabla_0 E_{33} - \frac{2 \nabla_0 E_{33} \Omega'[t]}{\Omega[t]} - \frac{2 E_{33} \Omega'[t]^2}{\Omega[t]^2} + \frac{4 E_{33} \Omega''[t]}{\Omega[t]} ) \end{aligned} $
01	$ (-2 \nabla_1 \nabla_0 \psi - \frac{2 \nabla_1 \phi \Omega'[t]}{\Omega[t]} - \frac{\nabla_1 B \Omega'[t]^2}{\Omega[t]^2} + \frac{2 \nabla_1 B \Omega''[t]}{\Omega[t]}) + (\frac{\nabla^2 B_1}{2} - \frac{1}{2} \nabla^2 \nabla_0 E_1 - \frac{B_1 \Omega'[t]^2}{\Omega[t]^2} + \frac{2 B_1 \Omega''[t]}{\Omega[t]}) + (0) $
02	$ (-2 \nabla_2 \nabla_0 \psi - \frac{2 \nabla_2 \phi \Omega'[t]}{\Omega[t]} - \frac{\nabla_2 B \Omega'[t]^2}{\Omega[t]^2} + \frac{2 \nabla_2 B \Omega''[t]}{\Omega[t]}) + (\frac{\nabla^2 B_2}{2} - \frac{1}{2} \nabla^2 \nabla_0 E_2 - \frac{B_2 \Omega'[t]^2}{\Omega[t]^2} + \frac{2 B_2 \Omega''[t]}{\Omega[t]}) + (0) $
03	$ (-2 \nabla_3 \nabla_0 \psi - \frac{2 \nabla_3 \phi \Omega'[t]}{\Omega[t]} - \frac{\nabla_3 B \Omega'[t]^2}{\Omega[t]^2} + \frac{2 \nabla_3 B \Omega''[t]}{\Omega[t]}) + (\frac{\nabla^2 B_3}{2} - \frac{1}{2} \nabla^2 \nabla_0 E_3 - \frac{B_3 \Omega'[t]^2}{\Omega[t]^2} + \frac{2 B_3 \Omega''[t]}{\Omega[t]}) + (0) $
12	$ \begin{aligned} & (\nabla_2 \nabla_1 \phi - \nabla_2 \nabla_1 \psi + \nabla_2 \nabla_1 \nabla_0 B - \nabla_2 \nabla_1 \nabla_0 \nabla_0 E + \frac{2 \nabla_2 \nabla_1 B \Omega'[t]}{\Omega[t]} - \frac{2 \nabla_2 \nabla_1 \nabla_0 E \Omega'[t]}{\Omega[t]} - \frac{2 \nabla_2 \nabla_1 E \Omega'[t]^2}{\Omega[t]^2} + \frac{4 \nabla_2 \nabla_1 E \Omega''[t]}{\Omega[t]} \\ & ) + (\frac{1}{2} \nabla_1 \nabla_0 B_2 - \frac{1}{2} \nabla_1 \nabla_0 \nabla_0 E_2 + \frac{1}{2} \nabla_2 \nabla_0 B_1 - \frac{1}{2} \nabla_2 \nabla_0 \nabla_0 E_1 + \frac{\nabla_1 B_2 \Omega'[t]}{\Omega[t]} - \\ & \frac{\nabla_1 \nabla_0 E_2 \Omega'[t]}{\Omega[t]} + \frac{\nabla_2 B_1 \Omega'[t]}{\Omega[t]} - \frac{\nabla_2 \nabla_0 E_1 \Omega'[t]}{\Omega[t]} - \frac{\nabla_1 E_2 \Omega'[t]^2}{\Omega[t]^2} - \frac{\nabla_2 E_1 \Omega'[t]^2}{\Omega[t]^2} + \frac{2 \nabla_1 E_2 \Omega''[t]}{\Omega[t]} + \frac{2 \nabla_2 E_1 \Omega''[t]}{\Omega[t]} \\ & ) + ( \nabla^2 E_{12} - \nabla_0 \nabla_0 E_{12} - \frac{2 \nabla_0 E_{12} \Omega'[t]}{\Omega[t]} - \frac{2 E_{12} \Omega'[t]^2}{\Omega[t]^2} + \frac{4 E_{12} \Omega''[t]}{\Omega[t]} ) \end{aligned} $
13	$ \begin{aligned} & (\nabla_3 \nabla_1 \phi - \nabla_3 \nabla_1 \psi + \nabla_3 \nabla_1 \nabla_0 B - \nabla_3 \nabla_1 \nabla_0 \nabla_0 E + \frac{2 \nabla_3 \nabla_1 B \Omega'[t]}{\Omega[t]} - \frac{2 \nabla_3 \nabla_1 \nabla_0 E \Omega'[t]}{\Omega[t]} - \frac{2 \nabla_3 \nabla_1 E \Omega'[t]^2}{\Omega[t]^2} + \frac{4 \nabla_3 \nabla_1 E \Omega''[t]}{\Omega[t]} \\ & ) + (\frac{1}{2} \nabla_1 \nabla_0 B_3 - \frac{1}{2} \nabla_1 \nabla_0 \nabla_0 E_3 + \frac{1}{2} \nabla_3 \nabla_0 B_1 - \frac{1}{2} \nabla_3 \nabla_0 \nabla_0 E_1 + \frac{\nabla_1 B_3 \Omega'[t]}{\Omega[t]} - \\ & \frac{\nabla_1 \nabla_0 E_3 \Omega'[t]}{\Omega[t]} + \frac{\nabla_3 B_1 \Omega'[t]}{\Omega[t]} - \frac{\nabla_3 \nabla_0 E_1 \Omega'[t]}{\Omega[t]} - \frac{\nabla_1 E_3 \Omega'[t]^2}{\Omega[t]^2} - \frac{\nabla_3 E_1 \Omega'[t]^2}{\Omega[t]^2} + \frac{2 \nabla_1 E_3 \Omega''[t]}{\Omega[t]} + \frac{2 \nabla_3 E_1 \Omega''[t]}{\Omega[t]} \\ & ) + ( \nabla^2 E_{13} - \nabla_0 \nabla_0 E_{13} - \frac{2 \nabla_0 E_{13} \Omega'[t]}{\Omega[t]} - \frac{2 E_{13} \Omega'[t]^2}{\Omega[t]^2} + \frac{4 E_{13} \Omega''[t]}{\Omega[t]} ) \end{aligned} $
23	$ \begin{aligned} & (\nabla_3 \nabla_2 \phi - \nabla_3 \nabla_2 \psi + \nabla_3 \nabla_2 \nabla_0 B - \nabla_3 \nabla_2 \nabla_0 \nabla_0 E + \frac{2 \nabla_3 \nabla_2 B \Omega'[t]}{\Omega[t]} - \frac{2 \nabla_3 \nabla_2 \nabla_0 E \Omega'[t]}{\Omega[t]} - \frac{2 \nabla_3 \nabla_2 E \Omega'[t]^2}{\Omega[t]^2} + \frac{4 \nabla_3 \nabla_2 E \Omega''[t]}{\Omega[t]} \\ & ) + (\frac{1}{2} \nabla_2 \nabla_0 B_3 - \frac{1}{2} \nabla_2 \nabla_0 \nabla_0 E_3 + \frac{1}{2} \nabla_3 \nabla_0 B_2 - \frac{1}{2} \nabla_3 \nabla_0 \nabla_0 E_2 + \frac{\nabla_2 B_3 \Omega'[t]}{\Omega[t]} - \\ & \frac{\nabla_2 \nabla_0 E_3 \Omega'[t]}{\Omega[t]} + \frac{\nabla_3 B_2 \Omega'[t]}{\Omega[t]} - \frac{\nabla_3 \nabla_0 E_2 \Omega'[t]}{\Omega[t]} - \frac{\nabla_2 E_3 \Omega'[t]^2}{\Omega[t]^2} - \frac{\nabla_3 E_2 \Omega'[t]^2}{\Omega[t]^2} + \frac{2 \nabla_2 E_3 \Omega''[t]}{\Omega[t]} + \frac{2 \nabla_3 E_2 \Omega''[t]}{\Omega[t]} \\ & ) + ( \nabla^2 E_{23} - \nabla_0 \nabla_0 E_{23} - \frac{2 \nabla_0 E_{23} \Omega'[t]}{\Omega[t]} - \frac{2 E_{23} \Omega'[t]^2}{\Omega[t]^2} + \frac{4 E_{23} \Omega''[t]}{\Omega[t]} ) \end{aligned} $

$$\delta W_{\mu\nu} \Omega = 1$$

00	$\left( -\frac{2\nabla^4\phi}{3} - \frac{2\nabla^4\psi}{3} - \frac{2\nabla^4\nabla_0\mathbf{B}}{3} + \frac{2}{3}\nabla^4\nabla_0\nabla_0\mathbf{E} \right) + (\mathbf{0}) + (\mathbf{0})$
11	$\begin{aligned} & \left( -\frac{1}{3}\mathbf{g}_{11}\nabla^4\phi - \frac{1}{3}\mathbf{g}_{11}\nabla^4\psi - \frac{1}{3}\mathbf{g}_{11}\nabla^4\nabla_0\mathbf{B} + \frac{1}{3}\mathbf{g}_{11}\nabla^4\nabla_0\nabla_0\mathbf{E} + \frac{1}{3}\mathbf{g}_{11}\nabla^2\nabla_0\nabla_0\phi + \right. \\ & \frac{1}{3}\mathbf{g}_{11}\nabla^2\nabla_0\nabla_0\psi + \frac{1}{3}\mathbf{g}_{11}\nabla^2\nabla_0\nabla_0\nabla_0\mathbf{B} - \frac{1}{3}\mathbf{g}_{11}\nabla^2\nabla_0\nabla_0\nabla_0\nabla_0\mathbf{E} + \frac{1}{3}\nabla^2\nabla_1\nabla_1\phi + \frac{1}{3}\nabla^2\nabla_1\nabla_1\psi + \\ & \frac{1}{3}\nabla^2\nabla_1\nabla_1\nabla_0\mathbf{B} - \frac{1}{3}\nabla^2\nabla_1\nabla_1\nabla_0\nabla_0\mathbf{E} - \nabla_1\nabla_1\nabla_0\nabla_0\phi - \nabla_1\nabla_1\nabla_0\nabla_0\psi - \nabla_1\nabla_1\nabla_0\nabla_0\nabla_0\mathbf{B} + \nabla_1\nabla_1\nabla_0\nabla_0\nabla_0\nabla_0\mathbf{E} \left. + \right. \\ & \left. \nabla^2\nabla_1\nabla_0\mathbf{B}_1 - \nabla^2\nabla_1\nabla_0\nabla_0\mathbf{E}_1 - \nabla_1\nabla_0\nabla_0\nabla_0\mathbf{B}_1 + \nabla_1\nabla_0\nabla_0\nabla_0\nabla_0\mathbf{E}_1 \right) + (\nabla^4\mathbf{E}_{11} - 2\nabla^2\nabla_0\nabla_0\mathbf{E}_{11} + \nabla_0\nabla_0\nabla_0\nabla_0\mathbf{E}_{11}) \end{aligned}$
22	$\begin{aligned} & \left( -\frac{1}{3}\mathbf{g}_{22}\nabla^4\phi - \frac{1}{3}\mathbf{g}_{22}\nabla^4\psi - \frac{1}{3}\mathbf{g}_{22}\nabla^4\nabla_0\mathbf{B} + \frac{1}{3}\mathbf{g}_{22}\nabla^4\nabla_0\nabla_0\mathbf{E} + \frac{1}{3}\mathbf{g}_{22}\nabla^2\nabla_0\nabla_0\phi + \right. \\ & \frac{1}{3}\mathbf{g}_{22}\nabla^2\nabla_0\nabla_0\psi + \frac{1}{3}\mathbf{g}_{22}\nabla^2\nabla_0\nabla_0\nabla_0\mathbf{B} - \frac{1}{3}\mathbf{g}_{22}\nabla^2\nabla_0\nabla_0\nabla_0\nabla_0\mathbf{E} + \frac{1}{3}\nabla^2\nabla_2\nabla_2\phi + \frac{1}{3}\nabla^2\nabla_2\nabla_2\psi + \\ & \frac{1}{3}\nabla^2\nabla_2\nabla_2\nabla_0\mathbf{B} - \frac{1}{3}\nabla^2\nabla_2\nabla_2\nabla_0\nabla_0\mathbf{E} - \nabla_2\nabla_2\nabla_0\nabla_0\phi - \nabla_2\nabla_2\nabla_0\nabla_0\psi - \nabla_2\nabla_2\nabla_0\nabla_0\nabla_0\mathbf{B} + \nabla_2\nabla_2\nabla_0\nabla_0\nabla_0\nabla_0\mathbf{E} \left. + \right. \\ & \left. \nabla^2\nabla_2\nabla_0\mathbf{B}_2 - \nabla^2\nabla_2\nabla_0\nabla_0\mathbf{E}_2 - \nabla_2\nabla_0\nabla_0\nabla_0\mathbf{B}_2 + \nabla_2\nabla_0\nabla_0\nabla_0\nabla_0\mathbf{E}_2 \right) + (\nabla^4\mathbf{E}_{22} - 2\nabla^2\nabla_0\nabla_0\mathbf{E}_{22} + \nabla_0\nabla_0\nabla_0\nabla_0\mathbf{E}_{22}) \end{aligned}$
33	$\begin{aligned} & \left( -\frac{1}{3}\mathbf{g}_{33}\nabla^4\phi - \frac{1}{3}\mathbf{g}_{33}\nabla^4\psi - \frac{1}{3}\mathbf{g}_{33}\nabla^4\nabla_0\mathbf{B} + \frac{1}{3}\mathbf{g}_{33}\nabla^4\nabla_0\nabla_0\mathbf{E} + \frac{1}{3}\mathbf{g}_{33}\nabla^2\nabla_0\nabla_0\phi + \right. \\ & \frac{1}{3}\mathbf{g}_{33}\nabla^2\nabla_0\nabla_0\psi + \frac{1}{3}\mathbf{g}_{33}\nabla^2\nabla_0\nabla_0\nabla_0\mathbf{B} - \frac{1}{3}\mathbf{g}_{33}\nabla^2\nabla_0\nabla_0\nabla_0\nabla_0\mathbf{E} + \frac{1}{3}\nabla^2\nabla_3\nabla_3\phi + \frac{1}{3}\nabla^2\nabla_3\nabla_3\psi + \\ & \frac{1}{3}\nabla^2\nabla_3\nabla_3\nabla_0\mathbf{B} - \frac{1}{3}\nabla^2\nabla_3\nabla_3\nabla_0\nabla_0\mathbf{E} - \nabla_3\nabla_3\nabla_0\nabla_0\phi - \nabla_3\nabla_3\nabla_0\nabla_0\psi - \nabla_3\nabla_3\nabla_0\nabla_0\nabla_0\mathbf{B} + \nabla_3\nabla_3\nabla_0\nabla_0\nabla_0\nabla_0\mathbf{E} \left. + \right. \\ & \left. \nabla^2\nabla_3\nabla_0\mathbf{B}_3 - \nabla^2\nabla_3\nabla_0\nabla_0\mathbf{E}_3 - \nabla_3\nabla_0\nabla_0\nabla_0\mathbf{B}_3 + \nabla_3\nabla_0\nabla_0\nabla_0\nabla_0\mathbf{E}_3 \right) + (\nabla^4\mathbf{E}_{33} - 2\nabla^2\nabla_0\nabla_0\mathbf{E}_{33} + \nabla_0\nabla_0\nabla_0\nabla_0\mathbf{E}_{33}) \end{aligned}$
01	$\begin{aligned} & \left( -\frac{2}{3}\nabla^2\nabla_1\nabla_0\phi - \frac{2}{3}\nabla^2\nabla_1\nabla_0\psi - \frac{2}{3}\nabla^2\nabla_1\nabla_0\nabla_0\mathbf{B} + \frac{2}{3}\nabla^2\nabla_1\nabla_0\nabla_0\nabla_0\mathbf{E} \right. \\ & \left. + \left( \frac{\nabla^4\mathbf{B}_1}{2} - \frac{1}{2}\nabla^4\nabla_0\mathbf{E}_1 - \frac{1}{2}\nabla^2\nabla_0\nabla_0\mathbf{B}_1 + \frac{1}{2}\nabla^2\nabla_0\nabla_0\nabla_0\mathbf{E}_1 \right) + (\mathbf{0}) \right. \end{aligned}$
02	$\begin{aligned} & \left( -\frac{2}{3}\nabla^2\nabla_2\nabla_0\phi - \frac{2}{3}\nabla^2\nabla_2\nabla_0\psi - \frac{2}{3}\nabla^2\nabla_2\nabla_0\nabla_0\mathbf{B} + \frac{2}{3}\nabla^2\nabla_2\nabla_0\nabla_0\nabla_0\mathbf{E} \right. \\ & \left. + \left( \frac{\nabla^4\mathbf{B}_2}{2} - \frac{1}{2}\nabla^4\nabla_0\mathbf{E}_2 - \frac{1}{2}\nabla^2\nabla_0\nabla_0\mathbf{B}_2 + \frac{1}{2}\nabla^2\nabla_0\nabla_0\nabla_0\mathbf{E}_2 \right) + (\mathbf{0}) \right. \end{aligned}$
03	$\begin{aligned} & \left( -\frac{2}{3}\nabla^2\nabla_3\nabla_0\phi - \frac{2}{3}\nabla^2\nabla_3\nabla_0\psi - \frac{2}{3}\nabla^2\nabla_3\nabla_0\nabla_0\mathbf{B} + \frac{2}{3}\nabla^2\nabla_3\nabla_0\nabla_0\nabla_0\mathbf{E} \right. \\ & \left. + \left( \frac{\nabla^4\mathbf{B}_3}{2} - \frac{1}{2}\nabla^4\nabla_0\mathbf{E}_3 - \frac{1}{2}\nabla^2\nabla_0\nabla_0\mathbf{B}_3 + \frac{1}{2}\nabla^2\nabla_0\nabla_0\nabla_0\mathbf{E}_3 \right) + (\mathbf{0}) \right. \end{aligned}$
12	$\begin{aligned} & \left( \frac{1}{3}\nabla^2\nabla_2\nabla_1\phi + \frac{1}{3}\nabla^2\nabla_2\nabla_1\psi + \frac{1}{3}\nabla^2\nabla_2\nabla_1\nabla_0\mathbf{B} - \right. \\ & \frac{1}{3}\nabla^2\nabla_2\nabla_1\nabla_0\nabla_0\mathbf{E} - \nabla_2\nabla_1\nabla_0\nabla_0\phi - \nabla_2\nabla_1\nabla_0\nabla_0\psi - \nabla_2\nabla_1\nabla_0\nabla_0\nabla_0\mathbf{B} + \nabla_2\nabla_1\nabla_0\nabla_0\nabla_0\nabla_0\mathbf{E} \left. + \right. \\ & \frac{1}{2}\nabla^2\nabla_1\nabla_0\mathbf{B}_2 - \frac{1}{2}\nabla^2\nabla_1\nabla_0\nabla_0\mathbf{E}_2 - \frac{1}{2}\nabla_1\nabla_0\nabla_0\nabla_0\mathbf{B}_2 + \frac{1}{2}\nabla_1\nabla_0\nabla_0\nabla_0\nabla_0\mathbf{E}_2 + \frac{1}{2}\nabla^2\nabla_2\nabla_0\mathbf{B}_1 - \frac{1}{2}\nabla^2\nabla_2\nabla_0\nabla_0\mathbf{E}_1 - \\ & \frac{1}{2}\nabla_2\nabla_0\nabla_0\nabla_0\mathbf{B}_1 + \frac{1}{2}\nabla_2\nabla_0\nabla_0\nabla_0\nabla_0\mathbf{E}_1 \left. + \right. (\nabla^4\mathbf{E}_{12} - 2\nabla^2\nabla_0\nabla_0\mathbf{E}_{12} + \nabla_0\nabla_0\nabla_0\nabla_0\mathbf{E}_{12}) \end{aligned}$
13	$\begin{aligned} & \left( \frac{1}{3}\nabla^2\nabla_3\nabla_1\phi + \frac{1}{3}\nabla^2\nabla_3\nabla_1\psi + \frac{1}{3}\nabla^2\nabla_3\nabla_1\nabla_0\mathbf$

