S.V.T. Decomposition in Conformal to Flat Space

$h_{00} = -2\phi$

$h_{0i} = w_i = \partial_i B + B_i$

$h_{ij} = -2\psi + S_{ij} = -2\psi + 2\partial_i\partial_j E + \partial_i E_j + \partial_j E_i + 2E_{ij}$

where

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

$\partial_i E^{ij} = 0$

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

Ω=1 Gauge invariant quantities:

$\psi = \psi$

$\mathcal{P} = \phi + \partial_0 B - \partial_0\partial_0 E$

$\mathcal{F}_i = \partial_0 E_i - B_i$

$E_{ij} = E_{ij}$

Ω=Ω(t) Gauge invariant quantities:

$C = \psi - \frac{\Omega'}{\Omega}(B - \partial_0 E)$

$\mathcal{P} = \phi + \frac{\Omega'}{\Omega}(B - \partial_0 E) + (\partial_0 B - \partial_0\partial_0 E)$

$\mathcal{F}_i = \partial_0 E_i - B_i$

$E_{ij} = E_{ij}$

$\delta G_{\mu\nu}$

00	$6\frac{\Omega'}{\Omega}\partial_0\psi - 2\nabla^2\psi + 2\frac{\Omega'}{\Omega}\nabla^2(B-\partial_0 E)$
11	$-2\partial_0\partial_0\psi - 2\frac{\Omega'}{\Omega}\partial_0(\phi+2\psi+E_{11}) + 2[(\frac{\Omega'}{\Omega})^2-2\frac{\Omega''}{\Omega}](\phi+\psi-\partial_1\partial_1 E-\partial_1 E_1-E_{11}) -$ $(\nabla^2-\partial_1\partial_1)(\phi-\psi+\partial_0 B-\partial_0\partial_0 E) - 2\frac{\Omega'}{\Omega}(\nabla^2-\partial_1\partial_1)(B-\partial_0 E) + (\partial_1\partial_0+2\frac{\Omega'}{\Omega}\partial_1)(B_1-\partial_0 E_1) + \Box E_{11}$
22	$-2\partial_0\partial_0\psi - 2\frac{\Omega'}{\Omega}\partial_0(\phi+2\psi+E_{22}) + 2[(\frac{\Omega'}{\Omega})^2-2\frac{\Omega''}{\Omega}](\phi+\psi-\partial_2\partial_2 E-\partial_2 E_2-E_{22}) -$ $(\nabla^2-\partial_2\partial_2)(\phi-\psi+\partial_0 B-\partial_0\partial_0 E) - 2\frac{\Omega'}{\Omega}(\nabla^2-\partial_2\partial_2)(B-\partial_0 E) + (\partial_2\partial_0+2\frac{\Omega'}{\Omega}\partial_2)(B_2-\partial_0 E_2) + \Box E_{22}$
33	$-2\partial_0\partial_0\psi - 2\frac{\Omega'}{\Omega}\partial_0(\phi+2\psi+E_{33}) + 2[(\frac{\Omega'}{\Omega})^2-2\frac{\Omega''}{\Omega}](\phi+\psi-\partial_3\partial_3 E-\partial_3 E_3-E_{33}) -$ $(\nabla^2-\partial_3\partial_3)(\phi-\psi+\partial_0 B-\partial_0\partial_0 E) - 2\frac{\Omega'}{\Omega}(\nabla^2-\partial_3\partial_3)(B-\partial_0 E) + (\partial_3\partial_0+2\frac{\Omega'}{\Omega}\partial_3)(B_3-\partial_0 E_3) + \Box E_{33}$
01	$-2\partial_1\partial_0\psi - 2\frac{\Omega'}{\Omega}\partial_1\phi - [(\frac{\Omega'}{\Omega})^2-2\frac{\Omega''}{\Omega}](\partial_1 B+B_1) + \frac{1}{2}\nabla^2(B_1-\partial_0 E_1)$
02	$-2\partial_2\partial_0\psi - 2\frac{\Omega'}{\Omega}\partial_2\phi - [(\frac{\Omega'}{\Omega})^2-2\frac{\Omega''}{\Omega}](\partial_2 B+B_2) + \frac{1}{2}\nabla^2(B_2-\partial_0 E_2)$
03	$-2\partial_3\partial_0\psi - 2\frac{\Omega'}{\Omega}\partial_3\phi - [(\frac{\Omega'}{\Omega})^2-2\frac{\Omega''}{\Omega}](\partial_3 B+B_3) + \frac{1}{2}\nabla^2(B_3-\partial_0 E_3)$
12	$\partial_1\partial_2(\phi-\psi+\partial_0 B-\partial_0\partial_0 E) + 2\frac{\Omega'}{\Omega}\partial_1\partial_2(B-\partial_0 E) + (\frac{1}{2}\partial_0+\frac{\Omega'}{\Omega})(\partial_1 B_2-\partial_1\partial_0 E_2+\partial_2 B_1-\partial_2\partial_0 E_1)$ $- [(\frac{\Omega'}{\Omega})^2-2\frac{\Omega''}{\Omega}](\partial_1 E_2+\partial_2 E_1+2\partial_1\partial_2 E+2E_{12}) - 2\frac{\Omega'}{\Omega}\partial_0 E_{12} + \Box E_{12}$
13	$\partial_1\partial_3(\phi-\psi+\partial_0 B-\partial_0\partial_0 E) + 2\frac{\Omega'}{\Omega}\partial_1\partial_3(B-\partial_0 E) + (\frac{1}{2}\partial_0+\frac{\Omega'}{\Omega})(\partial_1 B_3-\partial_1\partial_0 E_3+\partial_3 B_1-\partial_3\partial_0 E_1)$ $- [(\frac{\Omega'}{\Omega})^2-2\frac{\Omega''}{\Omega}](\partial_1 E_3+\partial_3 E_1+2\partial_1\partial_3 E+2E_{13}) - 2\frac{\Omega'}{\Omega}\partial_0 E_{13} + \Box E_{13}$
23	$\partial_2\partial_3(\phi-\psi+\partial_0 B-\partial_0\partial_0 E) + 2\frac{\Omega'}{\Omega}\partial_2\partial_3(B-\partial_0 E) + (\frac{1}{2}\partial_0+\frac{\Omega'}{\Omega})(\partial_2 B_3-\partial_2\partial_0 E_3+\partial_3 B_2-\partial_3\partial_0 E_2)$ $- [(\frac{\Omega'}{\Omega})^2-2\frac{\Omega''}{\Omega}](\partial_2 E_3+\partial_3 E_2+2\partial_2\partial_3 E+2E_{23}) - 2\frac{\Omega'}{\Omega}\partial_0 E_{23} + \Box E_{23}$