

PhysRevD.67.084023

```
1  from shared import *
2  import cdblib
3
4  jsonfile = 'prd67.json'
5  cdblib.create (jsonfile)
6
7  # -----
8  # eqn 19 = hamiltonian constraint
9  lhs := 0. # cdb(prd67.eq19.lhs, lhs)
10 rhs := R - ABar_{a b} ABar^{a b} + (2/3) trK**2. # cdb(prd67.eq19.rhs, rhs)
11
12 cdblib.put ('prd67.eq19.lhs', lhs, jsonfile)
13 cdblib.put ('prd67.eq19.rhs', rhs, jsonfile)
14
15 # -----
16 # eqn 20 = momentum constraint
17 lhs := 0. # cdb(prd67.eq20.lhs, lhs)
18 rhs := \partial_{a}(ABar^{i a})
19         +6 ABar^{i a} \partial_{a}(\phi)
20         + ABar^{a b} GammaBar^{i}_{a b}
21         - (2/3) gBar^{i a} \partial_{a}(trK). # cdb(prd67.eq20.rhs, rhs)
22
23 cdblib.put ('prd67.eq20.lhs', lhs, jsonfile)
24 cdblib.put ('prd67.eq20.rhs', rhs, jsonfile)
25
26 # -----
27 # eqn 27 = conformal transform of \Gamma
28 lhs := \Gamma^{a}_{b c}. # cdb(prd67.eq27.lhs, lhs)
29 rhs := GammaBar^{a}_{b c}
30         + 2 gBar^{a}_{c} \partial_{b}(\phi)
31         + 2 gBar^{a}_{b} \partial_{c}(\phi)
32         - 2 gBar_{b c} gBar^{a e} \partial_{e}(\phi). # cdb(prd67.eq27.rhs, rhs)
33
34 cdblib.put ('prd67.eq27.lhs', lhs, jsonfile)
35 cdblib.put ('prd67.eq27.rhs', rhs, jsonfile)
```

$$0 = \mathcal{H} = R - \bar{A}_{ab}\bar{A}^{ab} + \frac{2}{3}\mathrm{tr}K^2 \quad (\text{prd67.eq19.rhs})$$

$$0 = \exp(4\phi)\mathcal{D}^i = \partial_a\bar{A}^{ia} + 6\bar{A}^{ia}\partial_a\phi + \bar{A}^{ab}\bar{\Gamma}^i{}_{ab} - \frac{2}{3}\bar{g}^{ia}\partial_a\mathrm{tr}K \quad (\text{prd67.eq20.rhs})$$

$$\Gamma^a{}_{bc} = \bar{\Gamma}^a{}_{bc} + 2\bar{g}^a{}_c\partial_b\phi + 2\bar{g}^a{}_b\partial_c\phi - 2\bar{g}_{bc}\bar{g}^{ae}\partial_e\phi \quad (\text{prd67.eq27.rhs})$$