## PhysRevD.62.044034 equation (20)

$$\begin{split} \partial_t \bar{\Gamma}^i &= -2 \bar{A}^{ia} \partial_a N - 2 N \partial_a \bar{A}^{ia} \\ &= -2 \bar{A}^{ia} \partial_a N - 2 N \left( -6 \bar{A}^{ia} \partial_a \phi - \bar{A}^{ab} \bar{\Gamma}^i{}_{ab} + \frac{2}{3} \bar{g}^{ia} \partial_a \mathrm{tr} K \right) \end{split} \tag{eq19.106}$$

```
# Check against prd62.
    foo := @(dotGiBar).
                                                          # cdb (eq20.1cb,foo)
     bah = cdblib.get('prd62.eq20.rhs','prd62.json')
                                                        # cdb (eq20.prd,bah)
    diff := @(foo) - @(bah).
    distribute
                    (diff)
    diff = product_sort (diff)
     rename_dummies (diff)
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                    (diff, "simplify")
    map_sympy
                    (diff)
                                                          # cdb (eq20.chk,diff)
     canonicalise
```

$$\begin{split} & \text{eq20.lcb} := -2\bar{A}^{ia}\partial_a N - 2N\left(-6\bar{A}^{ia}\partial_a\phi - \bar{A}^{ab}\bar{\Gamma}^i{}_{ab} + \frac{2}{3}\bar{g}^{ia}\partial_a\text{tr}K\right) \\ & \text{eq20.prd} := -2\bar{A}^{ij}\partial_j N + 2N\left(\bar{\Gamma}^i{}_{jk}\bar{A}^{kj} - \frac{2}{3}\bar{g}^{ij}\partial_j\text{tr}K + 6\bar{A}^{ij}\partial_j\phi\right) \\ & \text{eq20.chk} := 0 \end{split}$$