

# Erratum: Symmetries and charges of general relativity at null boundaries

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1. The last four sentences in section 5.3 contain errors and should be replaced with the following text: However if we impose on this extension the condition

$$\nabla_{[a}\hat{\ell}_{b]} \cong 0,$$

then  $\Gamma_a$  is uniquely determined up to the transformation  $\Gamma_a \rightarrow \Gamma_a + \zeta \hat{\ell}_a$  for some  $\zeta$ . It follows that the pullback

$$\Gamma_i = \Pi_i^a \Gamma_a$$

is unique. The quantity  $\Gamma_i$  is invariant under a rescaling of the normal  $\ell^a \rightarrow e^\sigma \ell^a$ . It also satisfies

$$\Gamma_i \ell^i = 0$$

from eq. (5.22b).

2. In the third paragraph of appendix H, the equation  $\delta\kappa = -\Gamma_a \ell^a/2$  should be replaced with  $\delta\kappa = -\Gamma_i \ell^i/2$ .

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