IMPORTANT NOTE ON NOTATION

In this chapter I have been careful to distinguish between internal and external tangent tensors. In future chapters I am much more sloppy about this distinction. For instance, in this chapter I have denoted the soldering isomorphism by σ and its inverse by σ^{-1}. In later chapters I denote the soldering isomorphism by e and its inverse by θ, to conform with more standard notation. Then under the isomorphism e, the image of an admissible frame on an $O_\circ(3,1,R)$ – internal tangent bundle is the orthonormal frame $e_\alpha = e_\alpha{}^a \partial_a$ on the external tangent bundle.

The one highly nonstandard notation that I retain is

$$\begin{aligned}\nabla_c e_\beta{}^a &= \partial_c e_\beta{}^a + \{{}^a{}_{bc}\}\, e_\beta{}^b - \Gamma^\alpha{}_{\beta c}\, e_\alpha{}^a \\ &= e_\beta{}^b(\{{}^a{}_{bc}\} - \Gamma^a{}_{bc}) \\ &= e_\alpha{}^a(\{{}^\alpha{}_{\beta c}\} - \Gamma^\alpha{}_{\beta c}) \\ &= -\lambda^a{}_{\beta c}\ , \end{aligned} \tag{84}$$

rather than the usual

$$\nabla_c e_\beta{}^a = (\nabla_c e_\beta)^a = \{{}^\alpha{}_{\beta c}\}\, e_\alpha{}^a\ ; \tag{85}$$

which I would denote as $(\nabla_c e_\beta)^a$ except that I never use it. (Note that (85) has a Christoffel connection because e_β is a basis vector on the external bundle.)