

## The order of the differentiability of horizons

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Let  $L$  be a Lorentzian manifold. A topological hypersurface  $H \subset L$  is a horizon, if for every point  $p \in H$  there is a past oriented past inextendable light-like geodesic  $\gamma : [0, \alpha) \rightarrow L$ , such that  $\gamma$  lies in  $H$ , i.e.  $\gamma(t) \in H, \forall t \in [0, \alpha)$  and  $p = \gamma(0)$ . The geodesic  $\gamma$  is called a generator. For example a Cauchy horizon or a black-hole event horizon is a horizon. We will show, how can the order of the differentiability of the horizon vary along a generator, and give some examples.