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Optical geometries

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Abstract. We study the notion of optical geometry, defined to be a Lorentzian manifold equipped with a null line distribution, from the perspective of intrinsic torsion. This is an instance of a non-integrable version of holonomy reduction in Lorentzian geometry. Such distributions are tangent to congruences of null curves, which play an important rôle in general relativity. Their conformal properties are investigated. We also extend these ideas to generalised optical geometries as introduced by Robinson and Trautman.

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