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Title:	Action formulation in general relativity
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Keywords:	Action formulation
Issue Date:	28-Jul-2021
Publisher:	IISERM
Abstract:	This thesis focuses on three main aspects : a) Dynamics in flat spacetime b) Geodesic congru ences and Hypersurfaces c) Dynamics in Curved spacetime. In the first two chapters the author gives the brisk review of the particle and field dynamics in flat spacetime. The author provides a method to find transformation equation for a particle moving along arbitrary trajectory and further discusses electromagnetic field through four vector formalism. In chapter 3, the au thor provides review of the fundamentals of differential geometry and mathematical theory of geodesics based on a variational principle. In chapter 4, the author develops the mathematical techniques required in the description of congruences and the hypersurfaces. In particular, the author discusses the intrinsic and extrinsic geometery of the hypersurfaces. The core of the the sis is the last chapter which is devoted to the discussion of lagrangian formulation of the field theories in curved spacetime. Specifically, the focus of this chapter is to get the boundary term for gravitational field from the action principle.
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