Farben: HKS 1 HKS 8 HKS 41

LNP
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Chruściel · Jezierski · Kijowski
Hamiltonian Field Theory
in the Radiating Regime

The purpose of this monograph is to show that, in the radiation regime, there exists a Hamiltonian description of the dynamics of a massless scalar field, as well as of the dynamics of the gravitational field. The authors construct such a framework. They start by reviewing some elementary facts concerning Hamiltonian dynamical systems and then describe the geometric Hamiltonian framework, adequate for both the usual asymptotically-flat-at-spatial-infinity regime and for the radiation regime. The text proceeds to give a detailed description of the application of the new formalism to the case of the massless scalar field. Finally the formalism is applied to the case of Einstein gravity. The Hamiltonian role of the Trautman-Bondi is exhibited. A Hamiltonian definition of angular momentum at null infinity is derived and analysed.

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Piotr T. Chruściel Jacek Jezierski
Jerzy Kijowski

Hamiltonian Field Theory in the Radiating Regime

$$-\delta H(X,\mathscr{S}) = \int_{\mathscr{S}} \left(\pounds_X p^{\lambda}{}_{\mu\nu}\delta \mathfrak{g}^{\mu\nu} - \pounds_X \mathfrak{g}^{\mu\nu}\delta p^{\lambda}{}_{\mu\nu}\right) dS_\lambda$$
$$+\frac{1}{32\pi}\int_{S^2} \sin\theta \partial_u \chi_{AB}\delta\chi^{AB}\, d\theta\, d\varphi$$

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