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Constrained symplectic approach to the matter field

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We consider a two-dimensional field theory which is a deformation of the integrable Toda model coupled to matter field. With the following Lagrangian

$$\frac{1}{\kappa} \text{cal} L = \frac{1}{4} \partial_\mu \varphi \partial^\mu \varphi + i \bar{\chi} \gamma^\mu \partial_\mu \chi - M \bar{\chi} e^{2i(\varphi + r\theta)} \chi + \lambda_\mu (2 \bar{\chi} \gamma^\mu \chi - \epsilon^{\mu\nu} \partial_\nu (\varphi + v\theta)).$$

It is treated as a constrained system in the context of Faddeev–Jackiw and constrained symplectic formalism. We recover from this Gordon the massive Thirring model, through a process of Hamiltonian reduction, considering the equivalence of the Noetherian

Primary author(s) : BLAS, Harold (Instituto de Fisica-UFMT); QUICANO BELLIDO, Raul (IMCA-UNI); JARAMILLO MONSALVE, JORGE MAURICIO (IF UFMT)

Presenter(s) : QUICANO BELLIDO, Raul (IMCA-UNI)

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