

• Exercise: Series 9 •

1) Given the EOM for scalar solitons in 1+1 dimension

$$0 = \delta V = \delta \left\{ \int dx \left[\frac{1}{2} (\partial_x \phi)^2 + U(\phi) \right] \right\}$$

determine, taking inspiration from the classical mechanical analog, the solution for general U . You will obtain it in an implicit form, but you will manage to make it explicit in the example of the $\lambda\phi^4$ theory and of sine-Gordon, discussed in class. Also, use the solution you have found to compute its classical energy V .

