

# Frequencies and action variables for periodic KdV and dNLS on the circle

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We consider the KdV and defocussing NLS equation on the circle. A new approach to study the Hamiltonian as a function of action variables is demonstrated. The problems for the KdV equation is reformulated as the problem of conformal mapping theory corresponding to quasimomentum of the Hill operator. In particular, we determine the asymptotics of the Hamiltonian for small action variables. Moreover, we determine the gradient of Hamiltonian with respect to action variables. This gives so called frequencies and determines how the angles variables depend on the time. The main tool is the Löwner type equation for the quasimomentum.