



# Semiclassical limit for generalized KdV equations before the gradient catastrophe

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We study the semiclassical limit of the (generalised) KdV equation, for initial data with Sobolev regularity, before the time of the gradient catastrophe of the limit conservation law. In particular, we show that in the semiclassical limit the solution of the KdV equation: i) converges in  $H^s$  to the solution of the Hopf equation, provided the initial data belongs to  $H^s$ , ii) admits an asymptotic expansion in powers of the semiclassical parameter, if the initial data belongs to the Schwartz class. The result is also generalized to KdV equations with higher order linearities.

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