

# The Schamel equation: traveling wave solutions and numerical integration

Bachelor project

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The Schamel equation

$$\partial_t u + \sqrt{u} \partial_x u + \partial_{xxx} u = 0$$

is a time dependent partial differential equation with applications to ion acoustic waves in plasma physics. The equation possesses traveling wave solutions of the form  $u(t, x) = g(x - ct)$ . Some of them will be computed in the first part of this term project.

The numerical integration will be performed by a splitting method, where the linear part of the problem will be solved by FFT techniques. For the nonlinearity, the method of characteristics combined with an appropriate interpolation procedure will be used.

## References.

- [1] L. Einkemmer, A. Ostermann, A splitting approach for the Kadomtsev–Petviashvili equation, J. Comput. Phys. (2015), to appear