Bright soliton

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1 Introduction

The bright soliton provides a good test of the balance between kinetic dispersion and the attractive nonlinearity. It also tests the periodicity of the fft method.

```
using Plots, LaTeXStrings, Pkg, Revise
gr(legend=false,titlefontsize=12,size=(500,300),colorbar=false)
using FourierGPE
```

2 Potential function

```
import FourierGPE.V
V(x,t) = zero(x) |> complex
```

```
V (generic function with 3 methods)
```

2.1 Units

We work in units of ... Let's add a convenient plot

```
function showpsi(x,\ensuremath{\psi})
    p1 = plot(x,abs2.(\ensuremath{\psi}))
    xlabel!(L"x/a_x");ylabel!(L"|\psi|^2")
    p2 = plot(x,angle.(\ensuremath{\psi}))
    xlabel!(L"x/a_x");ylabel!(L"\textrm{phase}(\psi)")
    p = plot(p1,p2,layout=(2,1),size=(600,400))
    return p
end
```

2.2 User parameters

We initialize a struct to hold extra user parameters. At the lest, we should initialize it as a placeholder containing one variable.

```
@with_kw mutable struct Params <: UserParams @deftype Float64
    # parameters (at least a placeholder):
```