

Unit Checked Arithmetic via Unitful.jl

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Units and dimensional analysis are standard tools across the sciences for checking the correctness of your equation. However, most ODE solvers only allow for the equation to be in dimensionless form, leaving it up to the user to both convert the equation to a dimensionless form, punch in the equations, and hopefully not make an error along the way.

DifferentialEquations.jl allows for one to use Unitful.jl to have unit-checked arithmetic natively in the solvers. Given the dispatch implementation of the Unitful, this has little overhead.

0.1 Using Unitful

To use Unitful, you need to have the package installed. Then you can add units to your variables. For example:

```
using Unitful  
t = 1.0u"s"
```

Notice that `t` is a variable with units in seconds. If we make another value with seconds, they can add

```
t2 = 1.02u"s"  
t+t2
```

```
2.02 s
```

and they can multiply:

```
t*t2
```

```
1.02 s^2
```

You can even do rational roots: