

Computer Science in Ocean and Climate Research

Exercise 10

Tutorial: (Exercise June 23th, 2020) and **Home** (until June 30th, 2020):

- Perform ensemble runs with the predator prey model **without spatial diffusion** ...
- ... in the Fortran version ...
- ... using a namelist file (as in the 5th exercise).
- For a reference experiment, take the parameter values

$$\beta = 10.0, \gamma = 1.0, \delta = 3.0, \lambda = 1.0, \mu = 2.0,$$

the improved Euler method with the fixed step-size $\Delta t = 0.01$, and the time interval $[0, T]$ with $T = 20$.

- Write (in python or some other language) a script/program that performs the following steps:
 - Define N points for α on an equidistant grid in $[0, 2]$.
 - For each of them:
 - * modify the parameter α in the namelist file,
 - * run the model,
 - * store the output in some file.
 - Take the final value $x(T)$ of the prey population as output value.
- Plot the values of α and the corresponding values of $x(T)$.
- You can perform the same experiment with other fixed parameter values, other time step-sizes, and also perform the ensemble run for other parameters.
- **Do not change the original Fortran code to perform the ensemble run!**