# Lab # 4

**NOTE. For this lab you need subsample with timeseries, spatial fields or temporal spatial fields.**

Step 1. Choose about 3-6 variables from your dataset (2-3 – target variables, the rest - predictors).
Step 2. Analyze stationarity of a process (for mathematical expectation and variance) for all chosen variables. Make them more stationary if needed.
Step 3. Analyze covariance or correlation function for chosen target variables and mutual correlation functions among predictors and targets.
Step 4. Filter high frequencies (noise) with chosen 2 filters for target variables.
Step 5. Estimate spectral density function for  with and without filtering.
Step 6. Built auto-regression model filtered and non-filtered data. To analyze residual error and to define appropriate order of model.
Step 7. Build model in a form of linear dynamical system, using chosen predictors. To analyze residual error and to define appropriate order of model.