Exercises in Experimental Physics 4

Seminar 1
submission deadline: 20.04.20

Anti-Corona team work to see self-organisation of the student community in pandemic times. Each of the student subscribed to EP4 should perform the coin flip experiment and record one single random trajectory of a length $N = 100$. That means each student fills in four columns each of length 100. The first column A is simply the trial number i from 1 to 100 ($A_i = i$). The second column B is the result of flipping of the coin you use, either +1 or -1. The third column C is the sum over the second column, e.g. $C_k = \sum_{i=1}^{k} B_i$. This is an analogue of the displacement. Finally, the fourth column D represents the mean square displacement $D_k = \sum_{i=1}^{k} (C_i)^2$. Afterwards, you need to find one person who will perform an average over the EP4-ensemble of the results obtained and will deliver two graphs:

1. a graph showing all individual displacements (C_i vs. i) and the ensemble-averaged displacement;

2. a graph showing all individual mean square displacements (D_i vs. i) and the ensemble-averaged MSD.

   Upon successful evaluation, the threshold of 50% to get admission for the examination will be lowered to 45%.

   Please submit the final result per email directly to the lecturer.