

**Exercise 2, Nov 8, 2018**

Read Chapter 1 “Neural Dynamics” by Gregor Schöner, Hendrik Reimann, and Jonas Lins from the book “Dynamic thinking” (G Schöner, J Spencer and the DFT Research Group, Oxford University Press, 2016) (a proof of that chapter is downloadable as “DFT Primer textbook chapter 1” on the course webpage).

Answer the following questions in writing. Use illustrations and/or mathematical formulae, but also provide text in complete sentences!

1. Go through the Einstein argument at the beginning of the chapter. Explain, why without the  $-u$ -term, the variance of the level of activation increases in time. Formulate in your own words, why the  $-u$  term limits that increase. For illustration, you may take Figure 1.8 of the chapter and expand it, annotate it, explain it.
2. Around Figure 1.12 explain how input (a “stimulus”) is formally represented in neural dynamics. Describe how the temporal evolution of activation comes about after a stimulus is applied.
3. Discuss and illustrate what happens when an input/stimulus is removed again.
4. Vary the length of presentation of a stimulus and think through and illustrate what will happen then to neural activation. Is there a minimum length of presentation needed to get any positive activation?