I wanted to have this meeting to update you, Ulrike, on what the ideas I have so far regarding this project of metastability, and see what you think about them. More discuss this overview than necessarily discussing the details, though we can do that also.

Since we last talked about this, I learned qutie a bit and thought also about this project, and my approach for it has changed a bit. The way I think we should address the issues we want to discuss changed a bit. Also, last time I and Roberto made our intentions really confusing, I think. So I think we all had at least slightly different ideas of what we were trying to do. So I propose we have a slight fresh start now, and I will try to be clear about what my ideas and intentions are. Then, I would very much like to see what you think about them.

So, the big overview is the following, and I can go into details after this: I want to address some issues I see in the literature of metastability in neuroscience. Metastability is a highly used term in this field, is seen as a very important phenomenon and indeed is talked about in lots of important papers, from important researchers in the field. And I think its use it even growing in the last years, thats my impression at least.

The first issue is that of the definition: the term metastability has been used quite loosely, and though some papers do define it clearly, the definitions can be different in different papers. Specially considering the importance of this topic, I think a discussion regarding the different definitions is necessary. So in this first part I would like to mini-review the different definitions, discuss their main features and suggest what we think is a good definition, that could be adopted in the field. This definition would then in a sense capture the essence, the idea behind lots of the definitions present in the field. Though the definitions are clear, I think most of them have the same rough meaning: that of variations in the system's state, or patterns of activity, or behavior.

The second issue is that of measuring it: what is the meaning of a degree of metastability? how to define it? and how papers do it. In this case, an important point, connected to the first issue, is that of metastability happening in the different brain scales: it would be important I think to highlight how the degrees, and also the realization of metastability, can differ in different scales. Also point out that to understand a complex system we have to understand its behavior at different scales.

The third issue of importance, also connected to the first, is that of the mechanisms capable of leading to metastable behavior. From dynamical systems, we have lots of different ones of course. In this case, we could characterize the different mechanisms, discuss how they would be reflected in experimental data and how one could distinguish between them. This is the issue I thought the least about.

Practically speaking, what I suggest we do is to write three papers to address these issues: first, a perspective, or minireview paper for the first two. In this case, the Frontiers in Systems Neuroscience journal seems very appropriate, as it has quite a few papers on metastability already, and allows for these perspective articles. It is an open journal, but it has a program ... . So this first paper would not have any result specifically, or any modelling: just a theoretical discussion.

Then, the second paper would address the third issue, which to be honest I am quite excited about. Maybe it is too hard to do it the way I talked about it, but definitely we could something. Specially, and honestly, since you would help Ulrike. From the theoretical side that would be very nice. From the experimental side, you of course know people, and also we could have Roberto's postdoc advisor, Lyle Muller.

A third, smaller paper would also be possible. This one with results on the HB model: we could illustrate how metastable behavior can be different on different scales. This has some intersections with the one we

submited to chaos, but there are I think sufficient new results, and ways to address the issue, to warrant a new paper.