Task Reconnection 4.

"RMP penetration and NTM seeding"

Subtask 4.1 Experiments:

Systematic dependences of RMP penetration on plasma parameters such as plasma density are of crucial importance to guide theoretical research. In addition to AUG, DIII-D data are also suggested to be resourceful. In a later year at MRX, plasma flow can be imposed on MRX to study the effects of flow shear on reconnection rate.

1.5-year goal
Goal: The main goal is to clarify physics of NTM seeding by other MHD activity or external triggers and error field penetration. These tasks are linked together. The approach is to make detailed analysis of several well-diagnosed cases in AUG. For the theoretical modeling ultimately a full 3-d 2fluid model (M3D-C1) should be used. At the earlier stages we will use models with a less complete plasma model (XTOR or JOREK) or restricted to a simplified geometry (TM1.f). For a first phase, only NTM seeding analysis is foreseen.

MP/Princeton collaboration:
Princeton: make available M3D-C1 code for tests (We have to hire a postdoc for this. We are looking for a possible candidate.)
IPP: analysis of AUG data (the same postdoc + V.Igochine)

Approximate 4-year goal

RMP penetration experiment is foreseen after installation new power supplies for AUG coils (approx. from 2014). Comparison with M3D-C1 results is requires as well.

Comparison of the NTM seeding between AUG and NSTX. This has to be also supported by M3D-C1 simulations.

Personal: postdoc + V. Igochine

Remark: We are going to focus more on this task and consider others as a second priority because one needs more then one postdoc to make all in parallel. We will definitely help and support any experimental proposal from the other task, for example sawtooth experiment by M. Yamada on AUG, as well as analysis of the experimental data for sawtooth simulations.