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| **A description...** |  **Research Networking Programmes**  |
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**Short Visit Grant** [x]  **or** **Exchange Visit Grant** [ ]

***(please tick the relevant box)***

**Scientific Report**

**The scientific report (WORD or PDF file – maximum of eight A4 pages) should be submitted online within one month of the event. It will be published on the ESF website.**

***Proposal Title****:* The Aldous move on cladograms in the diffusion limit

 ***Application Reference N°:*** 6429

1. **Purpose of the visit**

In [Aldous '00], a mixing Markov chain on the space of N-cladograms (binary trees with N labeled leaves), which has the uniform N-cladogram as its stationary distribution, was given. The process picks a random leaf, removes it and re-inserts it to a randomly chosen edge.

The project, together with Mytnik and Winter, is to code the cladograms as excursions and obtain, after suitable rescaling, an excursion-valued limiting process which has the Brownian excursion as an invariant distribution and can be described and analysed with SPDE techniques.

The purpose of the visit was to get started with the project, exchange ideas, identify the correct coding by excursions and identify sub-projects, so that it is clear how to proceed in the project.

1. **Description of the work carried out during the visit**

We discussed coding the trees by contour processes, height processes or exploration processes. While considering the contour seems to complicate the dynamics, looking simultaneously at height and exploration processes seems to be the best thing to do.

We identified terms, that lead to drift and diffusion in vertical direction, and calculated that the horizontal and mixing components can essentially be neglected.

1. **Description of the main results obtained**

 We identified combinatorial problems that we have to solve in order to get an SPDE-description of the limiting process. We identified which parts of the discrete dynamics actually play a role in the limit, and which terms vanish after rescaling.

1. **Future collaboration with host institution (if applicable)**

 The project will definitely be continued. After that, the collaboration will most probably be continued with other projects.

1. **Projected publications / articles resulting or to result from the grant *(ESF must be acknowledged in publications resulting from the grantee’s work in relation with the grant)***

We expect that the project will be successfully finished after some time. Then, the results will of course be published, and the ESF will be acknowledged.

1. **Other comments (if any)**