

IPID4all Doctorate Research Exchange with TU Delft

Feedback report

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Model-based windfarm optimization

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Introduction

Dear reader,

My name is Andreas Rott and I have been a research assistant at ForWind Oldenburg since October 2013. The three month exchange with the TU Delft, which was made possible by the IPID4all stipend was my first longer international exchange. Although leaving my friends and family for this period behind was an inconvenience I don't regret this decision. Professionally for me these three month of chosen exile from my colleagues and obligations at Oldenburg were an opportunity to focus on my research and develop new perspectives. Especially the warm welcome at the TU Delft and the easy integration in the research process of Jan-Willem van Wingerden, allowed me to make great progress. I think three month is a good period to get an impression of an albeit similar but still different culture, although workwise I very well could imagine a longer exchange or hopefully another opportunity in the future.

Research Undertaken

The research area of Jan-Willems team has a good overlap with my own focus, and therefore I am especially pleased that we were able to openly discuss and synergise from each other rather than be competitors. Our common research goal is to find control and operation strategies for wind farms in order to increase the power output or to reduce the loads on the turbines, hence to reduce the electricity generation costs. Many different approaches for this are under research currently, but Jan-Willem and I focus on the development and the improvement of fast dynamic models, that allow predicting and - in the right control-framework optimizing the conditions of a windfarm.

During my stay in Delft and with the support of Jan-Willem and his team I was able to merge many of my own ideas of the past few years and build up my own simulation tool, which will be presented at the next wake conference 2017 (Fig. 1).

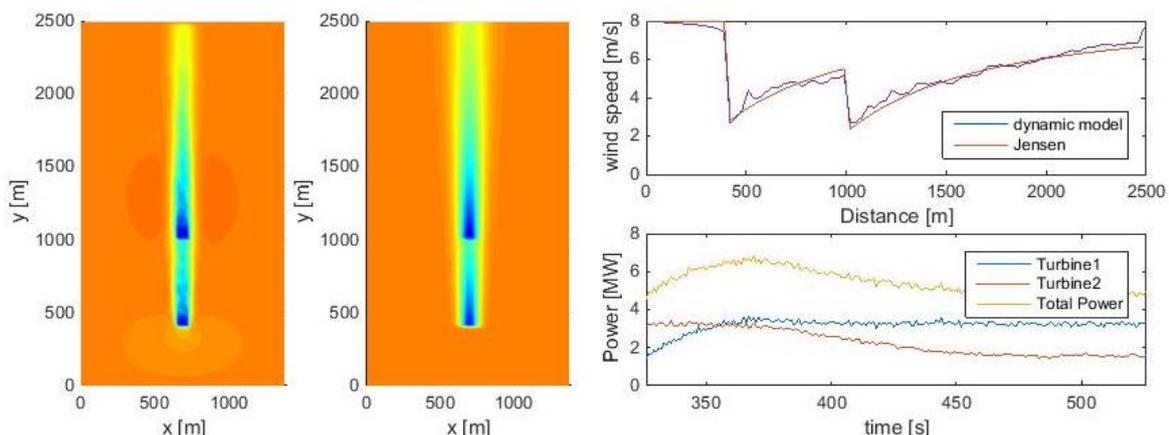


Fig. 1: Comparison of dynamic wake model with steady-state wake model

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Other than that I learned a lot of about the validation methods they use in Delft and became much more confident about my own research.

Personal Experience

Three month in a completely new environment is a very good timeframe to break out of old habits. It is a good opportunity to get a new perspective and gather motivation to change and improve. Next to these general thought I brought home I used my time in Delft to explore South Holland. Little Amsterdam (how Delft is called sometimes) is a wonderful little city, where most of the population is somehow related to the huge university. For its location Delft is placed right between the second and third largest cities of the Netherlands (Rotterdam and Den Haag resp.). Since the distances to both cities are below 15 km it was no effort to visiting these cities for sightseeing. Especially the beach at Den Haag is a sight I will not forget and hopefully can visit again soon.

Conclusions

Clearly moving to a foreign country and back again after only a few month is coupled with certain endeavours. Nevertheless from what I have learned in my IPID4all exchange to Delft it is worth it and I can only recommend trying to seize such an opportunity. For me it was a great experience and I would definitely do it again.

Sincerely,

Andreas Rott

Outlook

- o Abstract Submission Wake Conference 2017
- o two further publications are planned
- o further exchange is planned through joint publications

DAAD



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of Education
and Research