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In this newsletter of November we catch up on all the past events and some interesting research!

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SNELLIUS NEWSLETTER

November 2016



Dear <<First Name>>

The end of the year is coming closer and days are getting both cold and short. Luckily there are many opportunities during the holidays at this time of the year to meet up with family and friends. In this newsletter, our PhD candidate of the month is Steven van der Linden. He is studying the atmospheric boundary layer during the night. Furthermore, we wrote about what we found out during the evaluation meeting of Q1. The activity calendar is updated as well, with the Sinterklaas drink and the excursion to Airbus as the next upcoming activities. Please visit our [website](#) for further information or contact us!

PhD candidate of the month

The PhD candidate of the month is Steven van der Linden, he is researching the development of the atmospheric boundary layer during the night.

Hey everybody, one year ago I started as a PhD-candidate in our group under the supervision of Bas van de Wiel. In his team, we are investigating the atmospheric boundary layer at night. The

As a result vertical mixing is suppressed. Visa versa, under strong wind conditions, this turbulent mixing will remain strong and will reduce the cooling.

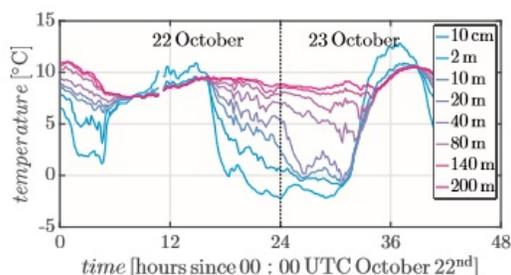
Last year, we have been working on a detailed observational analysis of the boundary layer at Cabauw. In particular, we were interested in the effect of the large-scale, external

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influenced by the earth's surface. And especially during the night the exciting stuff happens! Turbulence can collapse under the right circumstances...

When turbulence disappears, the surface can cool excessively (sometimes even 10 degrees compared to the day temperatures!), and frost and fog formation can occur (see Fig. 1). Societal impact of this phenomenon can therefore be large; think for example about slippery roads, reduced visibility, frost damage to crops, etc. So what actually occurred physically speaking?

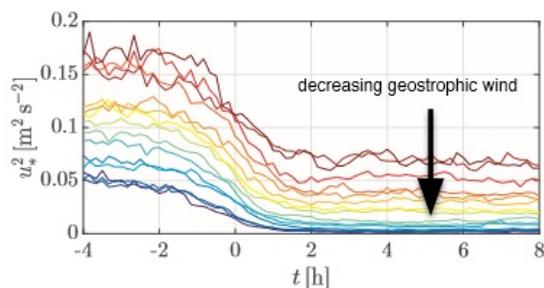
At night basically two processes are in competition: radiation and wind induced mixing (turbulence). Whereas the former tries to cool the surface and air close to the ground, the latter tries to prevent this by supplying warm air downwards. But they are also coupled to each other. When the wind is very weak and radiation dominates, the air becomes strongly stratified. This means that cold (heavy) air is below warmer air.



nights from an 11 year dataset according to their average geostrophic wind, we obtained the "averaged behaviour" of the boundary layer in time. In Figure 2 the response of turbulence to changing geostrophic wind is shown. As expected, the intensity of turbulence is heavily dependent on the wind forcing of the system. Interestingly, we find that for intermediate geostrophic winds the boundary layer can at times be either turbulent or non-turbulent! In the future, we would like to use advanced numerical models to investigate this intermittency further and see how (hypothesised) 3-dimensional structures relate to real observed boundary layers.

If you want to know more, feel free to contact me or Bas at s.j.a.vanderlinden@tudelft.nl or b.j.h.vandewiel@tudelft.nl.

By Steven van der Linden



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Figure 2, on the right shows the temporal evolution of the turbulent stress as function of the geostrophic wind. From red to dark blue, the geostrophic wind decreases from 15 m/s to 2 m/s.

Evaluation meeting Q1

Some weeks ago the evaluation of Q1 took place, a short summary about this meeting is written down here.

Recently, the first course evaluation of the academic year took place. The secretary provided a nice lunch and a lot of the first-year students were there, which was great! The courses that were considered were “Geodesy and Remote Sensing”, “Physics of the Earth and Atmosphere” and “Geo-measurement processing”. The students were most positive about the Physics course.

There was also a lot of constructive criticism. Most of it was about “Geodesy and Remote Sensing”. This was also the case in previous years, but we do notice improvements over the years. We received a lot of helpful information and suggestions that will most certainly improve the quality of the course. We will discuss all our findings with the respective teachers on the 8th of December.

There were some general comments as well. As in previous years, the students thought it is a tough start and you have to quickly adapt to the set pace of the lectures. There were many assignments during the quarter, but mainly the spread of the assignments could improve, because most of them were at the same time at the end of the quarter. That gave some trouble in the exam preparations.

Another point that will be discussed is the timing of the seminars, because it is planned during the break of the longest day of the week. Changing this to another day would be beneficial. The feedback given on the individual courses and the planning of quarter 1 will be discussed with the teachers and the results will be communicated to you afterwards.

By Snellius

[Upcoming activities:](#)

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- Wed 21 December - Christmas Drinks
- Wed 11 January - Activity t.b.a

Want to stay up2date with all our activities? Subscribe to our calendar via [Google Calendar](#) or the [direct ICS link](#)



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