



WP6 List of scientific publications

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PNOWWA

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PNOWWA

PROBABILISTIC NOWCASTING OF WINTER WEATHER FOR AIRPORTS

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Abstract

This document gathers together the WP6 list of scientific publications. There were 6 peer-reviewed conference papers, 1 conference paper and 2 presentations.

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Abbreviations

ATM	Air Traffic Management
PNOWWA	Probabilistic Nowcasting of Winter Weather for Airports
WP	Work Package

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Executive Summary

The Single European Sky Initiative (SESAR) coordinates all the European Union R&D activities concerning Air Traffic Management (ATM). The SESAR Exploratory Research projects are the first research instruments to tackle a certain ATM discipline. PNOWWA - Probabilistic Nowcasting of Winter Weather for Airports – is a SESAR exploratory research project developing methods to support the Air Traffic Management (ATM) challenged by winter weather.

Introduction

PNOWWA - Probabilistic Nowcasting of Winter Weather for Airports – is a research project developing methods to support the Air Traffic Management (ATM) challenged by winter weather. This includes developing new probabilistic radar-based nowcasting methods and tools, assessment of the potential of such ATM tools, and demonstrating the effect of those tools at airports during winter weather conditions. In the winter 2017, PNOWWA organized a real-time demonstration campaign providing to selected end-users very short-term (0-3h nowcast) probabilistic winter weather forecasts in 15min time resolution based on extrapolation of the movement of weather radar echoes.

This document brings together the list of publications to be collected within the deliverable 6.3. These publications are published either in peer-reviewed journals, in the outcome of scientific webinars and meetings or in scientific conference proceedings.

1 Peer-reviewed journal papers

- None

2 Magazines

- None

3 Thesis

- None

4 Peer-reviewed conference papers

1. Pulkkinen S. and Koistinen J., 2016, Probabilistic Nowcasting of Snowfall for Aviation, the 9th European Conference on Radar in Meteorology and Hydrology (ERAD2016), 10-14 October, Antalya, Turkey.

- Available: <https://erad2016.mgm.gov.tr/abstracts?userId=235> (abstract)

Reliable forecasts of heavy snowfall are critical for air traffic, as such events can cause major disruptions and additional costs. Aiming at aviation applications, we have developed a probabilistic radar-based nowcasting method for snowfall and associated phenomena. The presented approach is an extension of the stochastic ensemble prediction system (STEPS) [Seed 2003 and Bowler et al. 2004, 2006]. For estimating the advection field, we utilize an improved multiscale optical flow technique aiming at maximization of consistency between forward and backward flows [Pulkkinen et al. 2016]. We have studied the geographic, flow- and scale-dependency and growth and decay of snowfall and validated the nowcasting method by using the C-band dual-polarization radar located at Vantaa, Finland.

2. Kaltenboeck R. et al., 2017, PNOWWA - Probabilistic Nowcasting of Winter Weather for Airports, *the 38th AMS Radar Conference*, 28 August – 1 September 2017 Chicago, USA.
3. Kaltenboeck R., et al., 2017, PNOWWA – Probabilistic Nowcasting of Winter Weather for Airports. 2nd European Nowcasting Conference, 3-5. May 2017, Offenbach, Germany
4. Haukka H. et al, accepted, Probabilistic Nowcasting to increase airport safety and capacity, European Geosciences Union General Assembly 2018, 8–13 April 2018, Vienna, Austria.
5. Kaltenboeck R. et al., accepted, PNOWWA - Probabilistic Nowcasting of Winter Weather for Airports: Demonstration campaigns and airport stakeholder interactions. European Geosciences Union General Assembly 2018, 8–13 April 2018, Vienna, Austria.
6. Harri, A.-M., 2017, Winter Weather - Probabilistic Nowcasting to Increase Airport Safety and Capacity, Seventh SESAR Innovation Days, November, 28-30, Belgrade, Serbia.

5 Conference papers

1. Juntti H. et al, 2017, Probabilistic Winter Weather Nowcasting supporting Total Airport Management, *WMO Aeronautical Meteorology Scientific Conference*, , 6-10 November, Centre International de Conférences, Météo-France, Toulouse, France

6 Presentations

1. Juntti H. et al. 2017, Provision of probabilistic nowcasts (PNOWWA project), International Workshop on Meteorology and Air Traffic Management “Management of Meteorological Uncertainty”, May 24.-25, Sevilla, Spain.
2. Kaltenboeck, R. et al. 2017, Probability of snow nowcasting for airports, Seventh SESAR Innovation Days, November, 28-30, Belgrade, Serbia.

7 Other dissemination

- None

8 Conclusions

PNOWWA project WP6 dissemination achieved its goals mainly as planned. Some planned articles were submitted later than planned and some were postponed for future or cancelled. PNOWWA was visible e.g. in SID's, AMS and EGU receiving a good reception from the ATM.

References

- None