

# User Workshop on Dust Products for Aviation, 1<sup>st</sup> April 2020, remote meeting

## Introduction

Atmospheric mineral dust affects in different ways the aviation activities: damages aircraft turbines, disturbs airport operations when visibility is reduced, produces dangerous flight conditions when icing is triggered by dust. All this can lead to tragic events, unplanned repairing costs and costly flight rescheduling.

Scientific developments in dust measurement and modeling enables more optimized approaches to reduce costs, optimize flight planning and save lives.

## The Workshop aims:

- to review current research and commercial solutions to deal with the impacts of dust on aviation;
- to highlight the available information on atmospheric dust relevant for aviation
- to identify gaps in current measurement and modelling capability in order to improve air traffic management and safety
- to explore and propose actions for establishing efficient integration and interfacing between data producers and data users

## Meeting connection:

<https://global.gotomeeting.com/join/349952837>

## Organisers:



WORLD  
METEOROLOGICAL  
ORGANIZATION



European Research Area  
for Climate Services



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## **Possible Workshop discussing topics**

### **Available applications**

Long-term effects of dust abrasion on aircraft engines during cruising flight phase aircrafts are exposed to long-term dust influence which causes engines abrasion and similar damages. Dust reanalysis is excellent facility to have a retrospective assessment of accumulated dust impact on engines. Dust reanalysis database can be used to estimate levels of such unwanted damages. Several other global modes in the inDust community can be used for similar retrospective analyses. Their operational global dust forecasts can also be used for providing daily data along thousands of flight routes.

### **Predicting dust melting in turbines**

There is evidence that due to increased working temperatures of the new turbine generation, not only volcanic ash but also dust can melt in turbine surfaces. As a consequence, there is rather high repairing cost has to be paid in the aviation industry. A methodology has been proposed to predict dust melting probability during landing/takeoff for flights in dusty regions which combines dust concentration and its mineral composition to assess a melting index.

### **Icing due to dust**

Cloud icing can be a serious threat for the aviation flight operations. Most of indices currently in use to indicate expected icing zones are based on empirical relations by combining the atmospheric temperature, moisture and vertical velocity, mostly valid in the lower troposphere up to 5-6km. A new icing index application calculates icing formation taking into account dust effects as particularly efficient ice nucleation agent. It applies to cruising flight phases (7-8km and above).

## Agenda

Wednesday, 1 <sup>st</sup> April 2020		
09:00	09:20	Welcome: inDust and aims of the workshop (S. Nickovic, S. Basart)
Impacts and interfacing (Chair: A. Votsis)		
09:20	09:40	Dust impacts on gas turbine engines (Rory)
09:40	10:00	SATAVIA overview (D. Banister)
10:00	10:20	AsSISt Capgemini - data producer/user assistance and linking (C. Saüt)
10:20	10:50	SESAR outcomes (TBD)
10:50	11:00	Mid-morning break
Current and planned applications (Chair: S. Basart)		
11:00	11:20	EUNADICS – AV: Project on aviation hazards (B. Scherllin-Pirscher, L. Mona)
11:20	11:40	Climatological products for aviation: DustClim reanalysis (A. Votsis and T. Rautio)
11:40	12:00	Predicting probability of melted dust in turbines (B. Cvetkovic)
12:00	12:30	Modeling icing conditions due to dust ( S. Nickovic)
12:30	14:00	Lunch break
User experiences and needs (Chairs: S. Nickovic, S. Basart)		
14:00	14:20	Dust storms and airport warnings (D. Suarez)
14:20	15:00	Airlines participants (TBD)
15:00	16:30	Discussion and conclusions
	16:30	Closing