

DFG Priority Programme on Climate Engineering

## Detection and Attribution of Climate Engineering

3 – 5 DECEMBER 2018 // HAMBURG // ELSA-BRÄNDSTRÖM-HAUS

Organizers: Friederike Fröb, Sebastian Sonntag // Max Planck Institute for Meteorology, Hamburg

### Aim:

The overall aim of the workshop is to improve our understanding of how to apply detection and attribution (D&A) to climate engineering (CE). D&A studies use different statistical frameworks to identify signals that result from either external forcing or internal variability. Compared to the classical climate change D&A, in the case of CE only pseudo-observations are available and the background climate is contaminated by other anthropogenic drivers. D&A may be further complicated in the case of a combination of different CE methods, since the detectability of the single CE methods may be affected by each other or the combined signal may not be attributable to a single forcing. The workshop brings together experts from different climate science communities who work on D&A problems in order to share experiences, improve the knowledge base and foster collaborations.

### Questions to be discussed include the following:

- What are advantages and disadvantages of different D&A methods?
- How should results of D&A methods be interpreted?
- How does the effect of CE on variability affect D&A?
- How does D&A of CE differ for regional signals?
- How does event attribution need to be adapted to CE?

Elsa-Brandström-Haus: [www.ebh-hamburg.de](http://www.ebh-hamburg.de)

[www.spp-climate-engineering.de](http://www.spp-climate-engineering.de)

# WORKSHOP // AGENDA

## Detection and Attribution of Climate Engineering



### MONDAY, 3 DEC 2018

12:30 Lunch

#### Setting the scene

14:00 Welcome and introduction (Friederike Fröb, Sebastian Sonntag)

14:30 Overview DFG priority programme on CE (Andreas Oschlies)

Atmosphere-based CE (Ulrike Niemeier)

Ocean-based CE (Tatiana Ilyina)

Land-based CE (Julia Pongratz)

Regional CE (Johannes Quaas)

**15:20 Discussion**

15:50 Coffee break

#### D&A and applications to CE

16:20 Detection and attribution - the concept, robust detection methods and regional attribution challenges (Hans von Storch)

16:50 Using the observed record to constrain transient climate response, time of emergence, and large scale rainfall changes (Gabi Hegerl)

17:20 Optimal fingerprinting of solar radiation management (Eunice Lo)

**17:50 Discussion**

19:00 Dinner

**20:00 Walk to Elbe**

### TUESDAY, 4 DEC 2018

9:00 Trends in extremes / from global to local (Francis Zwiers)

9:30 Event attribution (Fredi Otto)

10:00 Causation in climate litigation (Tobias Pfrommer)

**10:30 Discussion**

11:00 Coffee Break

11:30 Climate change detection: characterising signal and memory (Claudie Beaulieu)

12:00 Time of emergence applied to CE (Friederike Fröb)

**12:30 Discussion**

13:00 Lunch

**14:00 Walk and visit of christmas market Blankenese**

# WORKSHOP // AGENDA

## Detection and Attribution of Climate Engineering



### TUESDAY, 4 DEC 2018 // AFTERNOON

#### New perspectives & methods

- 16:30 Assessing and detecting changes in internal variability in transient climate systems (Dian Putrasahan)
- 17:00 Observation and detection of solar geoengineering with feedback (David Keith, via Skype)
- 17:30 Discussion and wrap-up of day 1 and day 2**
- 19:00 Dinner
- 20:00 Evening presentation (Klaus Hasselmann & Hans von Storch)

### WEDNESDAY, 5 DEC 2018

- 9:00 D&A: the evolutionary transformation of backbenchers to forerunners (Dmitry Kovalevsky)
- 9:30 Causal counterfactual theory (Alexis Hannart)
- 10:00 The fraction of attributable risk for records, first steps towards non-stationary settings (Soulianh Thao)
- 10:30 Discussion**
- 11:00 Coffee break
- 11:30 Wrap-up and ways forward**
- 13:00 Lunch

## PARTICIPANTS

1. Claudie Beaulieu (University of California)
2. Ann-Kathrin Benner (University of Hamburg)
3. Ulrike Bernitt (GEOMAR Kiel)
4. Friederike Fröb (MPI-M)
5. Alexis Hannart (Ouranos, Montreal)
6. Klaus Hasselmann (MPI-M)
7. Gabi Hegerl (University of Edinburgh)
8. Sebastian Hettrich (MPI-M)
9. Tatiana Ilyina (MPI-M)
10. David Keller (GEOMAR Kiel)
11. Dmitry Kovalevsky (GERICS, HZG)
12. Eunice Lo (University of Bristol)
13. Christine Merk (IfW Kiel)
14. Sebastian Milinski (MPI-M)
15. Ulrike Niemeier (MPI-M)
16. Andreas Oschlies (GEOMAR Kiel)
17. Friederike Otto (University of Oxford)
18. Johannes Quaas (University of Leipzig)
19. Julia Pongratz (MPI-M, LMU Munich)
20. Tobias Pfrommer (University of Heidelberg)
21. Dian Putrasahan (MPI-M)
22. Jürgen Scheffran (University of Hamburg)
23. Hauke Schmidt (MPI-M)
24. Sebastian Sonntag (MPI-M)
25. Isabelle Steinke (KIT)
26. Hans von Storch (HZG)
27. Dipu Sudhakar (University of Leipzig)
28. Soulianh Thao (IPSL)
29. Giang Tran (GEOMAR Kiel)
30. Bernhard Vogel (KIT)
31. Alexander Winkler (MPI-M)
32. Francis Zwiers (University of Victoria)
33. David Keith (Harvard) -> via Skype
34. Nadine Mengis (Concordia University) -> via Skype