

## Toward an Antarctic Radiation Regional Network (ARRN)

### III circular

#### Background

In Antarctica, the assessment on a continental scale of radiation budget and related parameters is challenging due to the limited number of observation stations, and even more so when funding methods and the complexity of coordinating different research groups and activities are considered. All this has hindered concrete actions toward the creation of a regional network and its absence has inhibited the dissemination of the methods developed and implemented by the Baseline Surface Radiation Network (BSRN). The resulting lack of harmonisation/heterogeneity of measurements gives rise to an intrinsic weakness that can be overcome by establishing a network within the community.

To this end we have started to plan an initiative aimed at building a regional network for radiation in Antarctica.

The first step is to discuss in a workshop all the aspects connected to such objective, such as:

- radiation budget and its components,
- UV radiation (and columnar ozone from ground measurements),
- albedo/surface reflectance,
- clouds/cloud cover.

#### Implementation

The workshop will offer the chance to assess:

- i. any issues related to ongoing observations (where, which instruments, responsibility, long-term plan, instrumental challenges, methodologies, etc...),
- ii. actions to establish a regional network (including the connection to BSRN),
- iii. ways surface observations can provide information to climate models or help with assessing (through suitable indicators) climate state and trends.

The workshop will be held online, from 5 July to 7 July 2023 on Zoom, the link will be sent close to the meeting. Everyday there will be a single session at a time convenient to ensure a participation as broad as possible given the different time zones of attendees.

In addition to the virtual workshop, a hybrid side-event will be held 18 July 2023 at the IUGG23 in Berlin to keep the momentum going and strengthen the connection of ARRN initiative with the AntClimNow community.

#### Online workshop agenda

The three sessions will allow to address:

July 5, 2023

- Climate models and climate indicators:  
This session is aimed at assessing necessary inputs related to radiation budget for climate models (including ancillary information on cloudiness and surface characteristics), discussing in which way observations can be used in connection with models and help improving our application capability,

knowledge, system representation, and identifying possible climate indicator(s) relevant to AntClimNow objectives. The results of the discussion in this session will allow the development of a possible common data management plan (DMP).

July 6, 2023

- Assessment of the state of observations in Antarctica:  
All participants can present what is routinely performed, instruments, analysis and methodology, data management, historical data sets at disposal, challenges faced (of both instruments and methodology) and future plans.

July 7, 2023

- Moving toward an Antarctic Radiation Regional Network (ARRN):  
Starting from the information collected on the first day, the session is aimed at discussing a possible strategy to lay the groundwork for a regional network, trying to transfer and optimally use BSRN best practices, identify one or more common methodologies and better define the DMP.

The detailed draft timetable is as follows:

#### July 5, 2023

20:30 UTC Welcome, motivations and expected outcome of the workshop

20:45 UTC Yamanouchi Takashi, "Historical review of radiation budget observations in the Antarctic"

21:05 UTC Ohmura Atsumu, "The influence of the high-quality radiation observation for the improvement of climate modeling"

21:25 UTC Thomas Bracegirdle and Ilana Wainer, "An Introduction to AntClimNow and relevant activities including Antarctic Climate Indicators"

21:45 UTC break

22:00 UTC discussion and write-up recommendations on connection with climate models and possible climate indicators

23:00 UTC meeting adjourned

#### July 6, 2023

20:30 UTC expected outcome for the session

20:35 UTC Steve Colwell (UK), "Solar radiation measurements made by the British Antarctic Survey"

20:45 UTC Dan Lubin (USA), "Cloud Radiative Properties and Surface Energy Balance in West Antarctica"

20:55 UTC Logan Soldo (USA), "South Pole activities" (TBC)

21:05 UTC Kamil Laska (Czech Republic), "Solar radiation measurements at Mendel Station, northern Antarctic Peninsula: instrumentation and data processing"

21:15 UTC Seohee Ahn (Korea), "Current state and future plan for radiation measurements at Terra Nova Bay, Ross Sea"

21:25 UTC Angelo Lupi (Italy), "The BSRN observatory at Concordia Station (Antarctic Plateau): actual state and future improvements"

21:35 UTC measurements performed by other countries

21:45 UTC break

22:00 UTC discussion and write-up recommendations on strategies to improve observation coverage

23:00 UTC meeting adjourned

#### July 7, 2023

20:30 UTC expected outcome for the session

20:40 UTC speaker TBC, "Challenges of measurements in polar regions"

21:10 UTC Christian Lanconelli “Adapting BSRN best practices to polar region issues”

21:40 UTC break

21:50 UTC discussion and write-up recommendations on integration of activities and best practices implementation

23:00 UTC end of the workshop

The table below is to help connect at the right time

|              |           | USA<br>West<br>coast<br><br>(UTC-7) | USA<br>East coast<br><br>(UTC-4) | Argentina<br><br>(UTC-3) | UK<br><br>(UTC+1) | Central<br>Europe<br><br>(UTC+2) | Korea<br>and Japan<br><br>(UTC+9) | Australia<br><br>(UTC+10) |
|--------------|-----------|-------------------------------------|----------------------------------|--------------------------|-------------------|----------------------------------|-----------------------------------|---------------------------|
| <b>Start</b> | 20:30 UTC | 13:30 LT                            | 16:30 LT                         | 17:30 LT                 | 21:30 LT          | 22:30 LT                         | 5:30 LT                           | 6:30 LT                   |

(Times are translated considering the Daylight-Saving Time changes. If you spot any mistake, please let us know.)

### Side-meeting at IUGG23, Berlin, 18 July 2023

The meeting will be held in the morning with a hybrid format, Room 13 on level 3 of CityCube, 18 July 2023 9:00 – 12:30 LT (07:00 – 10:30 UTC).

Remote participation will be provided through Zoom.

At the end of the meeting a lunch will be offered also as an opportunity to brainstorm and deepen the discussion in an informal setting. At the moment we are taking into account vegan and gluten-free needs, if you know that more should be considered, please contact us.

#### Draft agenda

07:00 UTC (09:00 LT) welcome, motivations and expected outcome of the meeting

07:15 UTC (09:15 LT) Thomas Bracegirdle and Ilana Wainer, “How can AntClimNow and SCAR help to support an Antarctic Radiation Regional Network (ARRN)?”

07:40 UTC (09:40 LT) Yamanouchi Takashi, “Earth radiation budget from satellite and importance of ground truth radiation measurements in the Antarctic”

08:05 UTC (10:05 LT) Ohmura Atsumu, “The unique geographic location of the Antarctic in radiation climatology”

08:30 UTC (10:30 LT) Christopher Cox, title TBC

08:55 UTC (10:55 LT) break

09:10 UTC (11:10 LT) discussion and write-up recommendations on contribution of ARRN to AntClimNow Scientific Research Programme

10:30 UTC (12:30 LT) lunch

We continue to ask you to be ambassadors for this initiative, spreading this third circular to anyone that might be interested.

For further information or any need please refer to Claudia Frangipani ([claudia.frangipani@unich.it](mailto:claudia.frangipani@unich.it))