

MINUTES OF CLOUD-NET FIRST PROGRESS MEETING

27-28 May 2002, LMD meeting Room, Jussieu, Paris.

Present: Alain Protat, Claire Tinel, Jacques Testud, Julien Delanoe (IPSL); Martial Haeffelin, Vincent Noel, Marjolaine Chiriaco (LMD), Odile Thouron, Vincent Giraud (LOA, Lille), Philipp Currier, Jean-Pierre Clacyman (Degreane), Jean-Marcel Piriou (MeteoFrance); David Donovan, Henk Baltink (KNMI); John Goddard (RCRU); Damian Wilson (Met Office); Herman Russchenberg, Oleg Krasnov (TUD); Robin Hogan, Anthony Illingworth (co-ordinator.), Nicolas Gaussiat (Administrator) Dominique Bouniol (U of Reading).

1. INTRODUCTION AND GENERAL REMARKS

1.1 AJI summarised the project objectives and deliverables and reviewed progress since the first workshop November 2001 in Reading.

1.2 A twelve month no cost extension has been requested to Brussels. A revised timetable and budget has been submitted to Brussels and was tabled at the meeting. A verdict is awaited. The twelve month request is because:

i) The Palaiseau radar which had been returned to Canada for repair. (Note added later - mid-June it is in France awaiting customs clearance). The new tube ordered for the Chilbolton radar should be delivered in time for next October.

ii) The KNMI HIRLAM model is being currently modified and archiving should be underway shortly.

1.3 AJI listed four Reading papers acknowledging CloudNET which had been submitted for publication. He reminded everyone of the importance of acknowledging CloudNET support in publications and urged all papers for the forthcoming ERAD conference to do this.

ACTION 1.1. Participants to inform Nicolas Gaussiat (NG) of such publications and provide a link so that the web site could refer to them.

1.4 Finance. The statements for the first year had been submitted to Brussels.

ACTION 1.2 All partners to keep a record, on a weekly basis of the working time charged to each work package by each member of staff.

2. OVERVIEW OF INSTRUMENTS AND CALIBRATION ISSUES.

2.1. Palaiseau.

MH reported that the RASTA radar should be returned from Canada in a few weeks. During the summer experience would be gained operating the system so that by October 2002 the aim is that it should operate on a 24hr/7 day basis as do the cloud radars at Chilbolton and KNMI.

The polarimetric lidar (LNA - lidar-nuages-aerosols) had been operated on Mondays and Thursdays from January 2002 to the current date.

2.2 Chilbolton

2.2.1 JWFG reported that the new tube should be delivered in September and the radar operational again in time for the 1 October deadline.

2.2.2 The specification of the current radiometers was discussed.

ACTION 2.1 JWFG to provide a short document detailed the accuracy and threshold of the LWP product from these radiometers.

2.2.3 AJI presented an analysis of the Broad Band radiometers comparing the performance of the existing 'calibrated' Eppley with the new Kipp and Zonen which had been run in parallel at Chilbolton. For the short wave the mean differed by only 0.2W/m^2 with a σ of 9W/m^2 . The Kipp Zonen long wave mean bias was -7.68W/m^2 with a similar σ ; the bias could be removed by an empirical temperature correction.

ACTION 2. 2. DF to supply documentation on the BSRN standard radiometer calibration procedure.

2.2.4 RH provided a calibration update for the cloud radars which used the rain at 250m as a standard target of 19dBZ provided the radomes were shielded.

DW queried if the comparisons included times when the mode had rain - since these were rain events were masked out of the observations.

ACTION 2.3 UR to examine if the model comparisons were affected by masking out the precip cases from the observations.

2.3 Cabauw.

2.3.1 HB described the performance of the Degreane 'Horizon' 35GHz cloud radar and other instruments at Cabauw. The Horizon radar with a 1.8m antenna and 100W 150m uncoded pulses at 10KHz, achieves a sensitivity of -42dBZ at 5km for a 1 second average.

ACTION 2.4 KNMI - Compare the output of the RIVM lidar with that of the Vaisala CT75 ceilometer to check the sensitivity variation with range of the ceilometer.

ACTION 2.5 KNMI - Examine the output of the 1295MHz profiler to see if vertical air velocity can be inferred in the presence of cloud.

2.3.2 HR described the performance of the 3GHZ TARA radar. In cloud the return can be greater than the mm wave radars because of Bragg and coherent scatter.

2.4 Degreane.

2.4.1 PC described the Horizon radar design specification (see 2.3.1)

3 UPDATE ON MODEL DEVELOPMENTS AND ARCHIVING.

3.1 ECMWF. AI introduced a written submission by Adrian Tomkins which looked forward to a fully prognostic variance equation for q_v to replace the prognostic cloud cover and also the use of a separate variable for the ice microphysics. Observations to validated the PDF of q_v would be very valuable. The model variables for the three CloudNET sites are being archived by hand and stored on the CloudNET web site at UR

3.2 Met Office. DW reviewed progress. The new dynamics version of the model with essentially unchanged microphysics (symmetric pdf) should be operational on 9 July. A new physics scheme is being tested in the climate version, and in the future a new cloud scheme may be introduced. The model variables are being archived over the 3 stations. The plan is to archive mesoscale large scale cloud.

ACTION 3.1 UR/DW to check that convective cloud is being archived as well.

3.3 METEO-FRANCE. J-M P reported that model output will shortly be sent to Reading for archiving, including operational diagnosed cloud variables - this is still under development. New prognostic variables may be introduced in a test version of the model such as $q(\text{ice/liquid})$, $q(\text{rain/snow})$, or turbulent kinetic energy and may be sent to Reading to be compared versus both operational version and observed data.

3.4 KNMI. DD summarised the RACMO model (15mins, 55km 31 levels - ecmwf physics) being archived since April 02 and HIRLAM (3hr, 22km, 31 levels) to be archived in a couple of months.

ACTION 3.2 DD to clarify the archiving arrangements and specify the cloud variables (prognostic or diagnostic).

3.5 ARCHIVING ISSUES.

3.5.1 RH summarised the situation. It was decided to archive 30 second observations as a default.

3.5.2 KABA UW - net CDF data should be available in a few weeks.

3.5.3 TARA is currently binary but should be NetCDF in a few weeks.

3.5.4 Palaiseau will probably supply 10second lidar and should also have a rain gauge.

ACTION 3.3 DD and HR to expedite production of NetCDF data.

ACTION 3.4 Observations sites to confirm that rainfall rate is being measured and archive.

3.5.5. All model data will be stored at Reading. (See actions above).

ACTION 3.5 Model centres to confirm that rainfall rate is part of the data set to be archived (ECMWF are already doing this).

4. PROGRESS ON WORK PACKAGE 1 - ANALYSIS OF EXISTING DATA SETS. SIRTA

4.1 AD - Statistical properties of clouds. Lidar values of k , α and depolarisation ratio.

4.2 VN - Ice shape/orientation from depol data. Identify using depol ratio and inc angle.

4.3 AD - Lidar ice velocity - using Doppler lidar.

ACTION 4.1 AD to specify accuracy of Doppler lidar for various dwell times.

4.4 OT - Lidar observations and meso N-H model. C_i sensitivity - as per WG2 of GCSS.

4.5 HC - Polder sat ice results - polsn + IR - retrieve cloud ht and optical depth.

4.6 MC - Calipso retrievals using IR + lidar for cirrus - improved split window.

4.7. J.D.- Statistical properties of normalised PSD for ice using Clare 98.

ACTION 4.2. JD/JT to explore consistency of universal normalised ice psd to assumed ice density versus size assumption.

ACTION 4.3 JD/JT to extend the analysis to CEPEX data set and VIPS instrument. JT to contact Andy Heymsfield or similar to obtain the spectra.

4.8 CT - Ice retrievals using cloud radar and lidar. Described additional constraints on N_o^* . ACTION 4.4. CT to produce semi-operational code so this algorithm can be extended to other data sets within CloudNET.

4.9 AP - Water and ice clouds from dual beam airborne radar. From two looks retrieve W - derive statistical $V = f(\text{IWC})$ etc for different ice.

ACTION 4.4. AP to examine using size for CT (see 4.8) algorithm as extra constraint.

CHILBOLTON.

4.10 AI (E O'C)- Detectability of Sc with radar and lidar.

ACTION 4.5 KNMI examine stats of Sc with Horizon radar

4.11 RH - Supercooled clouds using radar/lidar and their radiative effects.

ACTION 4.6 RH to examine additional use of Doppler data for interpretation.

4.12 DB - Deriving updraught from Mie 94GHz spectral min in ppn.

4.13 AI (MB) - Comparing observed IWC with model IWC.

ACTION 4.7 MB supply further details to DW. Also remove rain from model data.

4.14 NG IWC and LWC from multiple frequency radar.

ACTION 4.8 NG contact DD/HB re applying algorithm to KNMI data.

CABAUW

4.15 DD - ARM radar/lidar analysis update and use of Doppler.

Discussion on bimodal spectra and use of dual frequency Doppler - see action 4.3.

4.16 OK - Radar/lidar retrievals for water cloud. Use of Z/alphas to distinguish onset of drizzle and adapt $Z = a IWC^b$ accordingly.

5. FUTURE PLANS FOR WORK PACKAGE 1 - EXISTING DATA SETS.

5.1 Deliverable #2 - Initial Analysis due data October 2002.

ACTION 5.1 ALL Participants to email their presentation to NG.

(n.gaussiat@reading.ac.uk). Text should be in Word or Power Point and figures supplied in a form which makes editing possible. Alternatively, please identify where we can find text which can be edited.

The material will be synthesised into a draught document in September and circulated for comment.

6. WORK PACKAGE 2 - OPERATION OF PILOT STATIONS OCT 02 -04.

6.1 It was agreed that at Palaiseau it was very important to have a ceilometer operating ground the clock to accompany the RASTA radar so that cloud properties could be retrieved.

ACTION 6.1 AI to write to KNMI to request loan of ceilometer for use at SIRT A.

6.2 The data archive was discussed. It was agree that the level 1 products should be values of Z, β every 30 seconds with noise and artefacts subtracted. The form of the level 2 products would be revisited and defined in October 02 when the retrievals were more mature.

ACTION 6.2 RH to circulate document on removal of noise and artefacts from Chilbolton data to other pilot stations for comment.

7. WP3 DEVELOPMENT OF ALGORITHMS

7.1 Deliverable #3 is the 'Initial Recommendations' due on October 2002.

It was decided to adopt the same strategy as in 5.1 and produce a draught document in September for comment from the submissions of the presentations given at this meeting.

8. WP4 COMPARE DATA WITH MODELS.

8.1 Deliverable #4 is 'A User Requirement Document' for delivery October 2002.

ACTION 8.1 DW and J-M P to produce such a document. AI to forward the early material supplied after the November workshop to facilitate this.

9. Date of Next Meeting KNMI. 21-22 October at KNMI.

ACTIONS

- 1.1 ALL
- 1.2 ALL
- 2.1 JWFG (RAL).
- 2.2 MH (CETP)
- 2.4 UR
- 2.4 KNMI
- 2.5 KNMI
- 3.1 UR/DW
- 3.2 DD (KNMI).
- 3.3 DD (KNI) AND HR (TUD0.
- 3.4 ALL STATIONS SITES.
- 3.5 ALL MODELLERS (exc ECMWF)
- 4.1 AD
- 4.2 JD/JT (CETP)
- 4.3 JD/JT (CETP)
- 4.4 CT (CETP)
- 4.5 KNMI
- 4.6 RH (UR)
- 4.7 MB (UR)
- 4.8 NG (UR)
- 5.1 ALL
- 6.1 AI (UR)
- 6.2 RH (UR)
- 8.1 DW(MOFFICE) J-M P (METEOFRACTANCE)

Anthony Illingworth, Reading, 17 June 2002

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