**SPICE-5:**

**List of documents for the meeting**

**Assignments for the preparation of documents**

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| SPICE Objectives (defined at IOC SPICE-1, Geneva, 2011) | Documents to be prepared in advance of the Sodankylä meeting, SPICE-5 | Contributors | Document lead (will consolidate the input) |
| 1. Recommend appropriate automated field reference system(s) for the unattended measurement of solid precipitation. Define and validate one or more field references using automatic instruments for each parameter being investigated, over a range of temporal resolutions (e.g. from daily to minutes).
 | Summary of reference report:  | team | Rodica |
| Overview of current results on the assessment of the R1 vs R2:  | Daqing Yang, Kai W | Daqing |
| Overview of current results on the assessment of the R2 vs R3:  | Roy; Bruce | Roy |
| Overview of the processing of Geonor data as a reference gauge: Assess how the processing procedure for Geonor and Pluvio data could be used for the other instruments tested: | Mike, Mareile, Audrey, Kai, Rodica | Mike |
| Summary of the data fields and processing of Pluvio data output and how this is used for SPICE and in operational applications (FMI, MeteoSwiss, etc) | Audrey/Kai/Samuel Buisan/Osmo, Yves-Alain | Samuel B |
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| 1. Assess/characterize automatic systems (both the hardware and the associated processing) used in operational applications for the measurement of Solid Precipitation (i.e. gauges as “black boxes”):
	1. Assess the ability of operational automatic systems to robustly perform over a range of operating conditions;
	2. Derive adjustments to be applied to measurements from operational automatic systems, as a function of variables available at an operational site: e.g., wind, temp, RH;
	3. Recommend ancillary data to enable the derivation of adjustments applied to data from operational sites on a regular basis, in real-time or near real-time;
	4. Assess operational data processing and data quality management techniques;
	5. Assess the minimum practicable temporal resolution for reporting a valid solid precipitation measurement (amount, snowfall, and snow depth on the ground);
	6. Evaluate the ability to detect and measure trace to light precipitation.
 | Summary of the Instruments included in the intercomparison which will require assessment, indicating which are from Instrument Providers, and which are proposed by the host organization.Where possible, include their configuration and message format (could include a sample), as collected. | Audrey/Francesco/Shane | Shane/ Francesco |
| Event selection methodology (developed for the reference)  | Mareile/Audrey | Audrey |
| Assessment of methods for data analysis for SoG. Include an evaluation of the current event selection approach relative to the SoG measurement | Craig, Samuel Morin, Barry, Rodica, Daniele | Craig |
| Summarize topics that are relevant and should be tracked during SPICE tests, to allow the robustness of sensors tested: e.g. failures, intermittence, etc. Include summary of experience operating sensors in SPICE (what has not worked, solutions, recommendations, etc) | Jeff Hoover, Samuel Buisan, Christian Zammit, Yves-Alain, Timo, Rodica | Yves-Alain |
| Methodologies explored to date for assessing catch efficiency and derive adjustments, by different teams, including past results. Assess how these methodologies could be expanded for the other instruments included in the intercomparison:  | Mareile, John, Daqing, Roy, Yves Lejeune, Samuel Morin, Barry | Mareile |
| Summarize data quality techniques explored to date or considered for use (e.g. implemented at NCAR) | Mareile, Mike, Craig, Samuel Morin | Mike |
| Summary of assessments and perspectives on using various time intervals for reporting solid precipitation with automatic gauges:  | John, Roy, Mareile, Paul | John |
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| 1. Provide recommendations on best practices and configurations for measurement systems in operational environments:
	1. On the exposure and siting specific to various types of instruments;
	2. On the optimal gauge and shield combination for each type of measurement, for different collection conditions/climates (e.g., arctic, prairie, coastal snows, windy, mixed conditions);
	3. On instrument specific operational aspects, specific to cold conditions: use of heating, use of antifreeze ( evaluation based on its hygroscopic properties and composition to meet operational requirements);
	4. On instruments and their power management requirements needed to provide valid measurements in harsh environments;
	5. on the use of visibility to estimate snowfall intensity
	6. On appropriate target(s) under snow depth measuring sensors;
	7. Consideration will be given to the needs of remote locations, in particular those with power and/or communications limitations.
 | Proposal for describing the siting of instruments currently in SPICE that could provide information on the impact of siting and configuration. Use the CIMO site classification, as baseline, where possible. | Yves-Alain, Timo, Craig, Christian, …. | Timo |
| Summary of heating configurations in various climate and snow regimes, and the results and experience to date.  | Roy, Craig, Mareile, Yves-Alain, Shelley, Christian, Jeff H | Craig |
| Assessment of antifreeze and oils; which characteristics are relevant for the performance.  | Craig, Jeff Hoover, Samuel Morin, | Jeff H |
| Summary of current solutions and configurations at the remote SPICE sites (Mueller Hut, Tapado, Forni Glacier, Pyramid): Proposal for operating gauges in a standard configuration, powered from an independent source, heater included, without intervention. Assess failure modes, range, power needs and consumption | Christian Zammit, Shane, Daniele, Guglielmina, Shelley | Christian Z |
| Snow targets: Summary of configurations and results to date (including pre-SPICE)  | Jeff Hoover, Samuel Morin, Osmo, Timo | Osmo |
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| 1. Assess the achievable uncertainty of the measurement systems evaluated during SPICE and their ability to effectively accurately report solid precipitation.
	1. Assess the sensitivity, uncertainty, bias, repeatability, and response time of operational and emerging automatic systems;
	2. Assess and report on the sources and magnitude of errors including instrument (sensor), exposure (shielding), environment (temperature, wind, microphysics, snow particle and snow fall density), data collection and associated processing algorithms with respect to sampling, averaging, filtering, and reporting.
 | Methodology for assessing the uncertainty of instruments in field environment: proposed and early results, including from the reference assessment.  | Paul J, John K, GyuWon Lee, Mareile, Yves Lejeune | John; GyuWon |
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| 1. Evaluate new and emerging technology for the measurement of solid precipitation (e.g. non-catchment type), and their potential for use in operational applications.
 | Current/past results using non-catchment type of sensors: data relevant for different objectives; proposed assessment (e.g. accumulation, use as ancillary data for accumulation using WG, etc):  | Mareile, Paul, GyuWon, Yves Lejeune, Faisal, Paul | Paul |
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| Other documents | Chair Report (summaries of 2013/14 experiments on all sites, with a focus on progress and issues) | Rodica | Rodica  |
| Summary of Commissioning reports | Francesco | Francesco |
| Snow of Ground: data analysis specific issues | Craig, Samuel Morin | Samuel M |
| Summary of RI Intercomparison data analysis and results:  | Audrey, Emanuele | Audrey |
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