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Summary of the BALTEX Working Group on Radar (WGR)

Jarmo Koistinen (FMI)

Daniel Michelson (SMHI)

BALTEX SSG, Helsinki, 13 Jan 2009

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Basic definitions

History of WGR:

- Established ~ 1995
- Chairman Jarmo Koistinen since 1997
- Permanent, retired or transient member(s) from DE, DK, EE, FI, NL, NO, PL, RU, SE, UK
- Has met annually (since 2004 part of BWRW)

NORDMET

- Collaboration board of the Nordic National Weather Services

NORA (Chairman Günther Haase, SMHI)

- A NORDMET activity fostering the Nordic development of common operational algorithms and software to create new radar products or improve existing ones for the quantitative use of radar data.
- The NORA group is open for representatives with full implementation rights from all European radar teams.

NORA organises the annual **Baltic Weather Radar Workshop (BWRW)** with open participation together with the national radar team(s) and WGR. Latest BWRW at IMGW, Sep 2008.

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Non declared objectives of WGR

- to promote the use of weather radar as a wind and precipitation observation system within the framework of BALTEX,
- to coordinate the use of weather radar in BALTEX,
- to promote extensions of the radar network around the Baltic Sea as well as implementation of new technologies and methodologies
- to encourage the establishment of a Radar Data Centre for use during the BALTEX Main Experiment (BRIDGE),
- to define those radar-based products to be generated and archived at the BRDC, and distributed to BALTEX Data Users,
- to conduct research and development on improving the quality and quantitative use of radar-based products in collaboration with COST and EUMETNET activities,
- to meet regularly and keep updated on the status of weather radars in the BALTEX Region,
- to inform the research community of its activities.

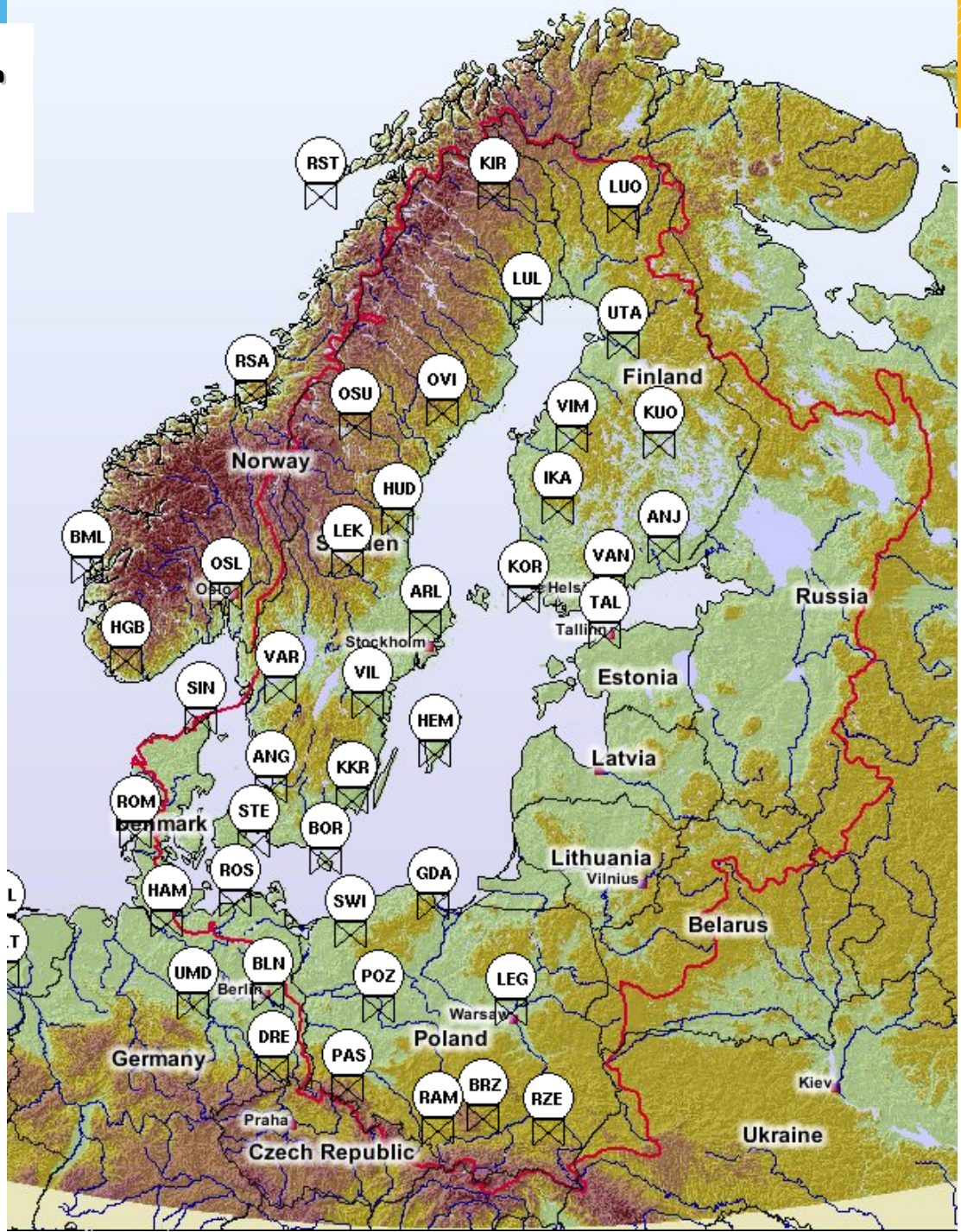
Most active years 1997-2002 when main BRDC practices were generated.

Baltex Radar Data Center
BRDC (BALTRAD)

- NORDRAD
- All of POLRAD
- Peripheral German radars
- Netherlands (wind profiles)

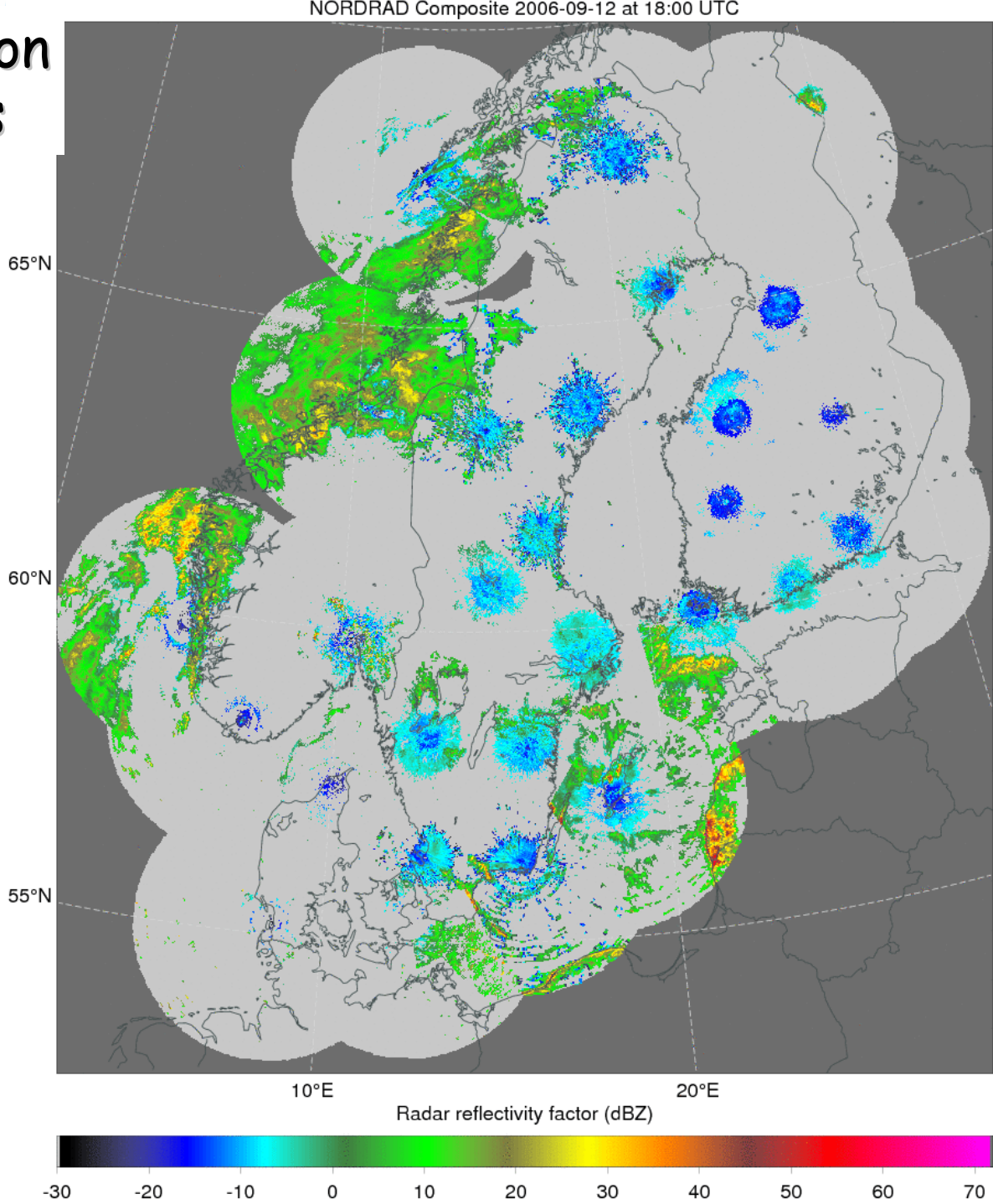
- One of the BALTEX data centers
- Located at SMHI, data available since Oct 1999
- R&D only
- Test environment for operational implementations

Courtesy of Daniel Michelson



Precipitation distribution with QC* every 15 mins

- Meteosat 8 (MSG)
- Cloud type product from NWC SAF: 4 km, 15 min
- 4 cloud-free classes
- No surrogate for good Doppler, but better than nothing
- Operational since March 1, 2006
- Improvements possible using quality flags in satellite product?



*Spin-off from: Michelson D.B. and Sunhede D., 2004: Spurious weather radar echo identification and removal using multisource temperature information. *Meteorol. Appl.* 11, 1-14

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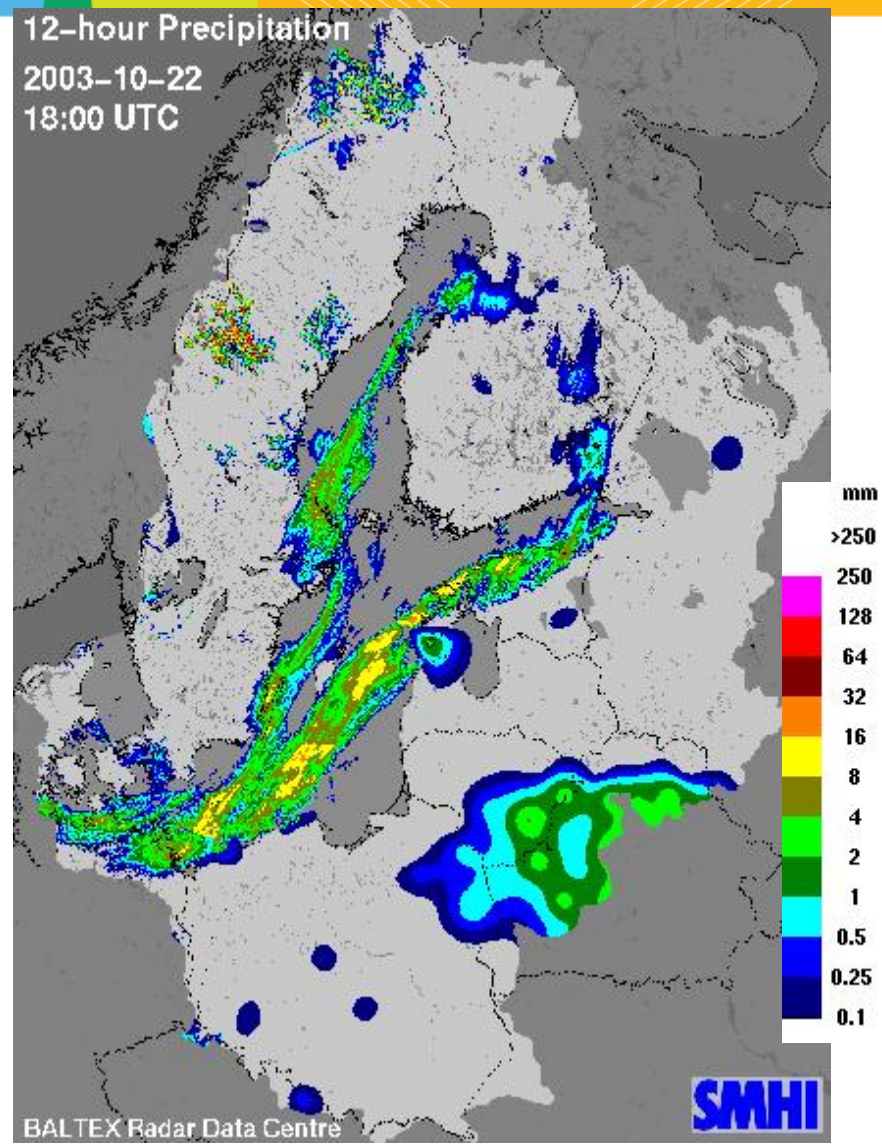
RR: 3 and 12 hour gauge-adjusted accumulated precipitation + gauges-only accumulation

- 2×2 km horizontal resolution
- Every 3 and 12 hours
- 32-bit depth
- Wind corrected gauge observations
- 3-hour BALTRAD area
- 12-hour BALTEX Region (see example)



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Some research topics at FMI relevant to BALTEX

Note: WGR is much too small and heterogeneous to be able to perform or promote common research activities. Members are bound to operations or, those in research, to externally funded projects defining the targets of interest.

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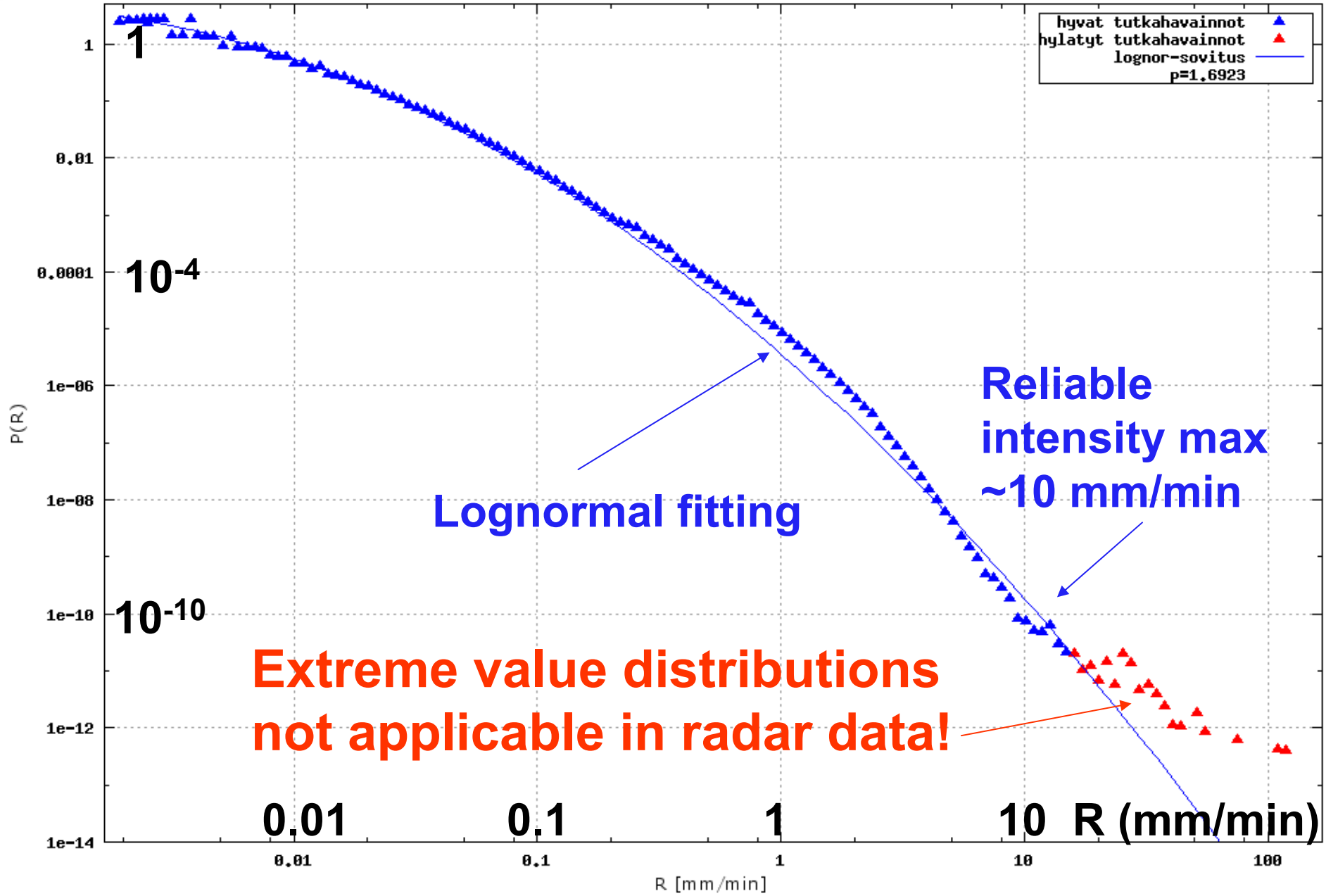
Derivation of Extreme Event Mesoscale Area-intensity Return Periods of Rainfall Based on a Large Sample of Radar Data

Jarmo Koistinen
Timo Kuitunen, Seppo Pulkkinen, Harri Hohti and Janne Kotro

Finnish Meteorological Institute

PDF of 4.6 billion intensity measurements



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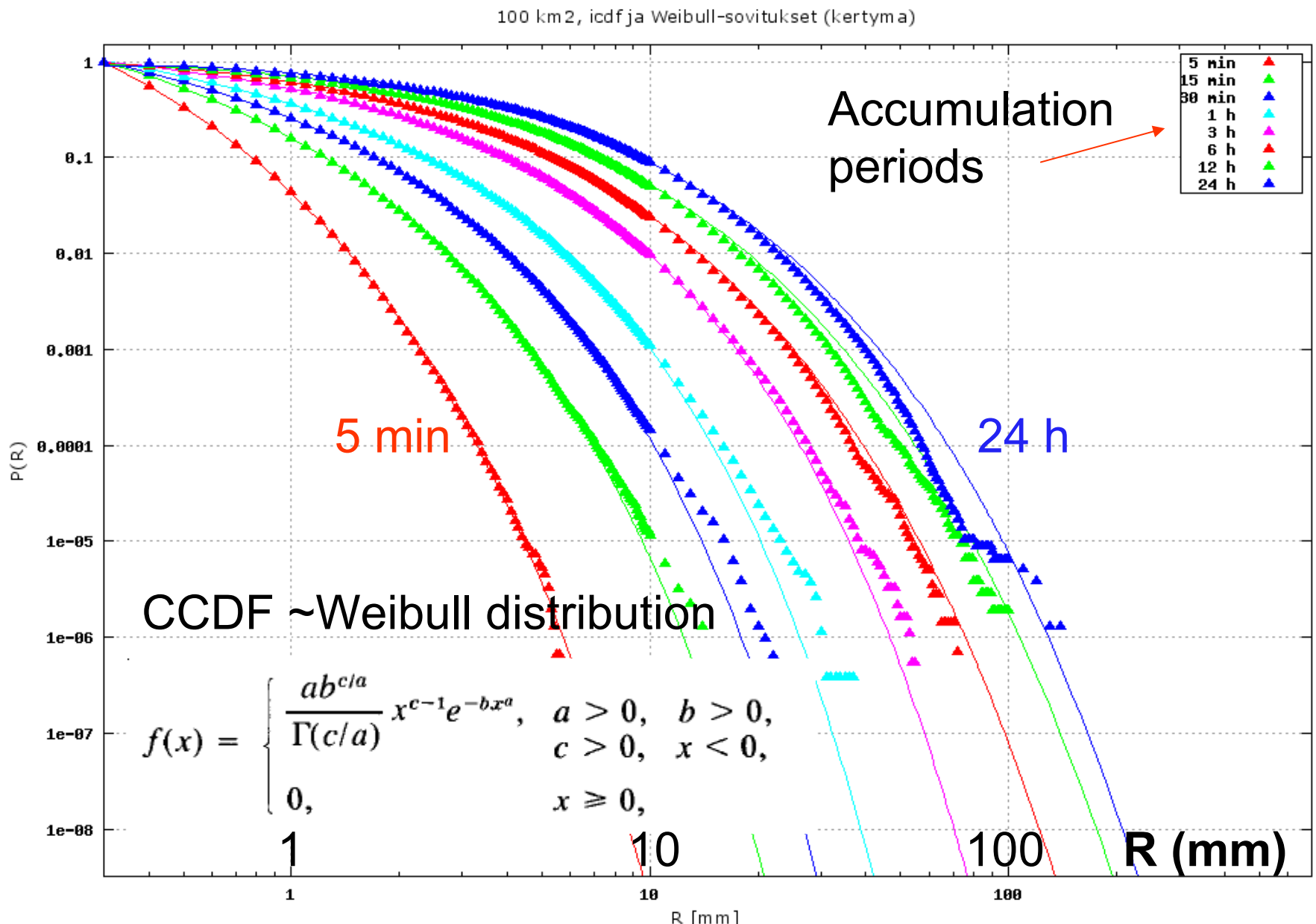
Example: CCDFs of 100 km²



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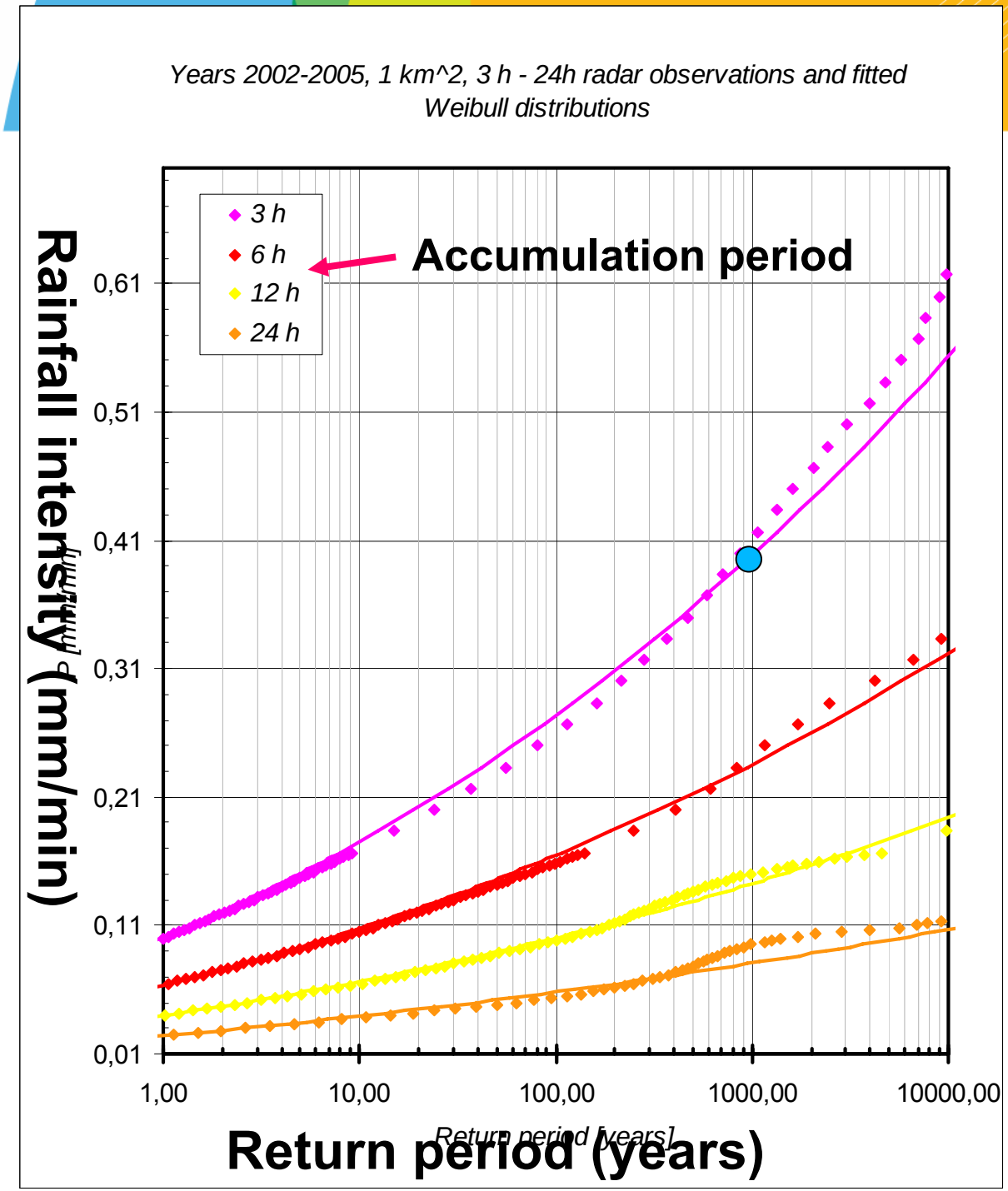
Return period of 1 km² areal rain (years)

Example:
0.4 mm/min = 0.4 x 180 mm = 72 mm in three hours once in every 1000 years



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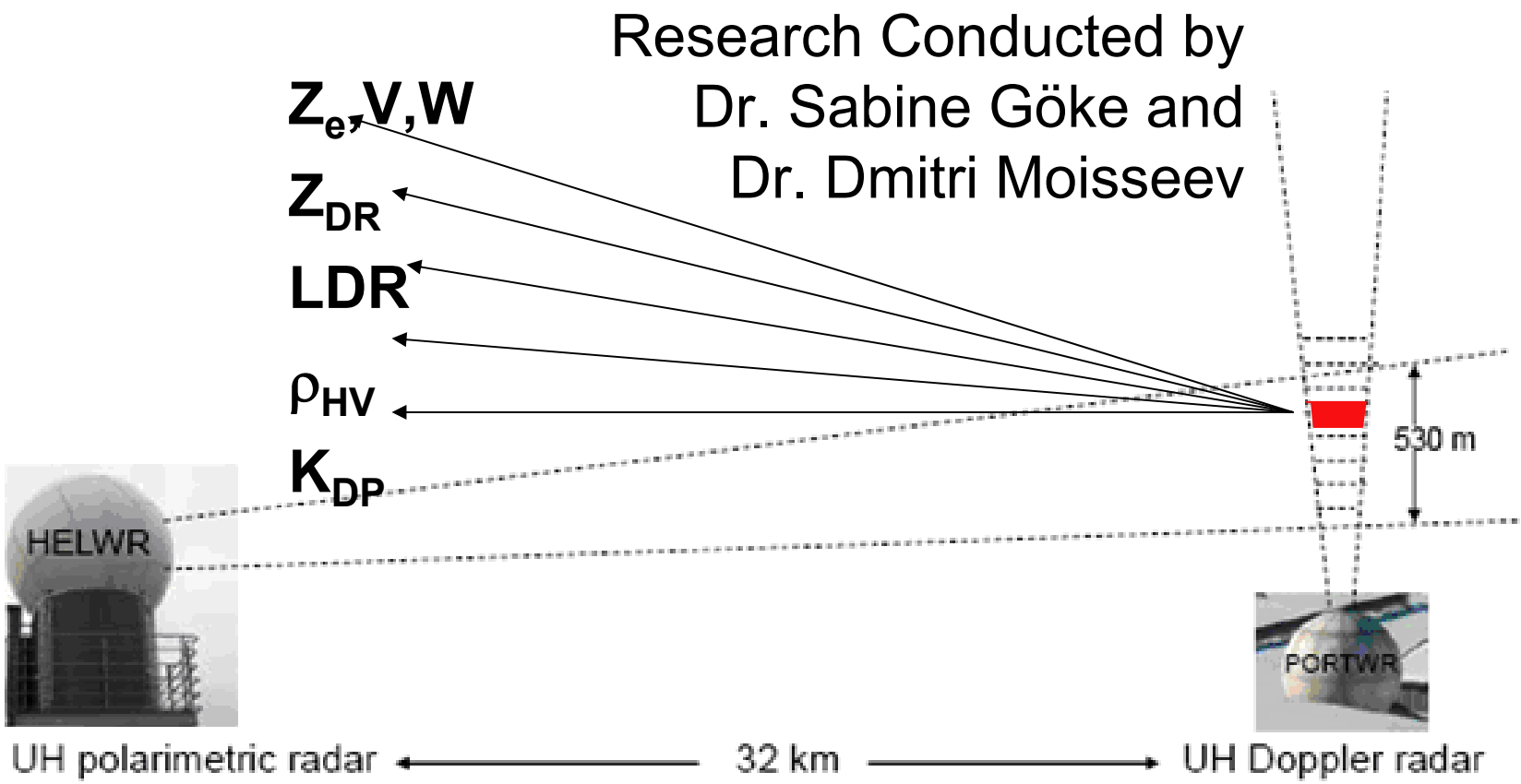
Research collaboration with NASA's Global Precipitation Measurement (GPM) mission

- Funded by the Academy of Finland (2009-2012)
- FMI, UH, TKK, SYKE

WP 1. Precipitation Process Studies
WP 2. Falling Snow Algorithm Development for GPM
WP 3. GPM Hydrology Studies
WP 4. Snow emission and backscattering modeling
WP 5. Validation of Current and Future Satellite Precipitation Products at High Latitudes

Core instrumentations: Helsinki Testbed & Sodankylä CEOP
Core target: Snow & snowfall

Comparison with polarimetric signatures (UH)



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Multidisciplinary applications of polarimetric weather radars (POMO, 2006 - 2009)

Partners: FMI, UH, TKK, MTT, Vaisala

POMO WP3: Precipitation type in winter

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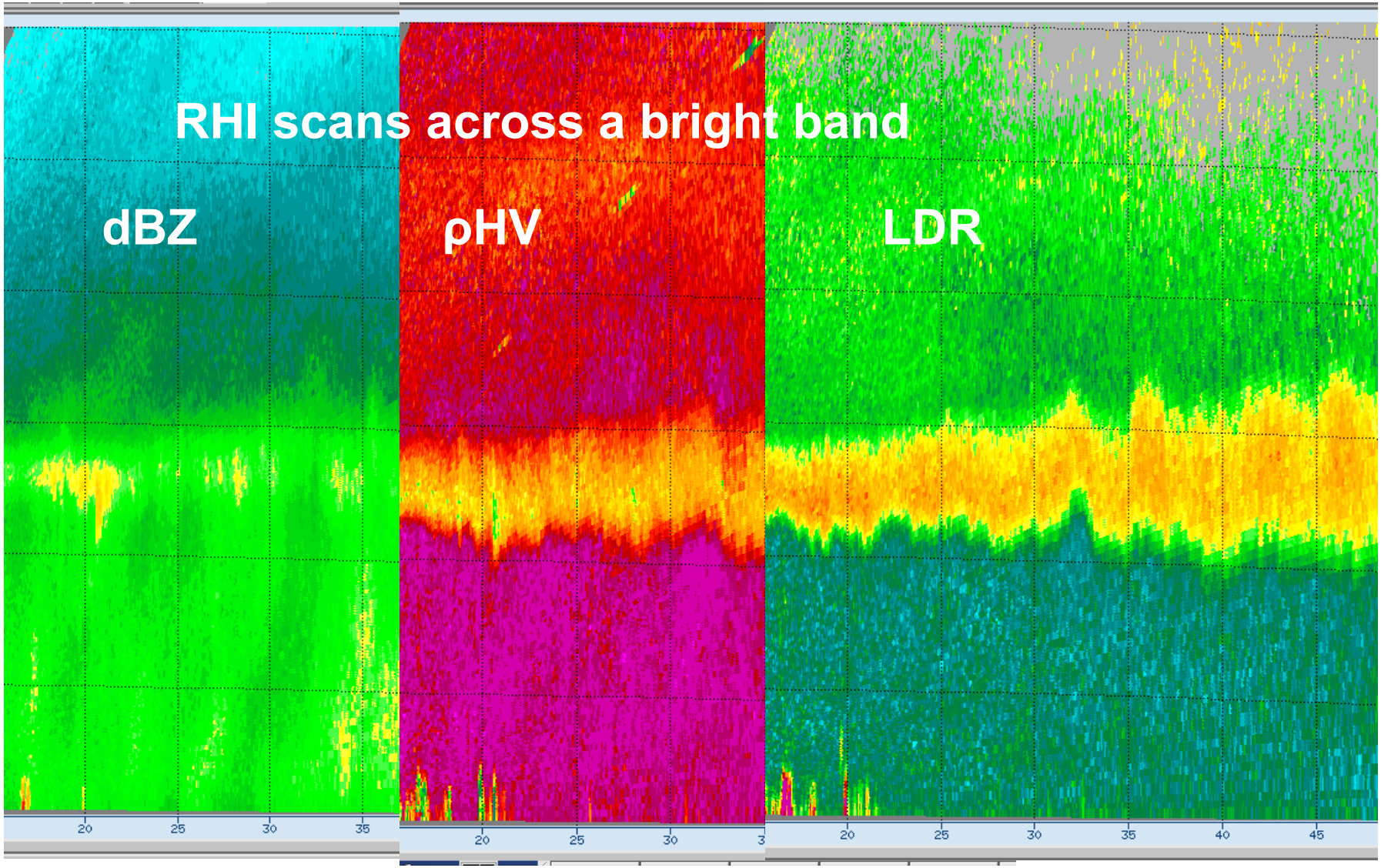

Polarimetric diagnosis will enhance the quality

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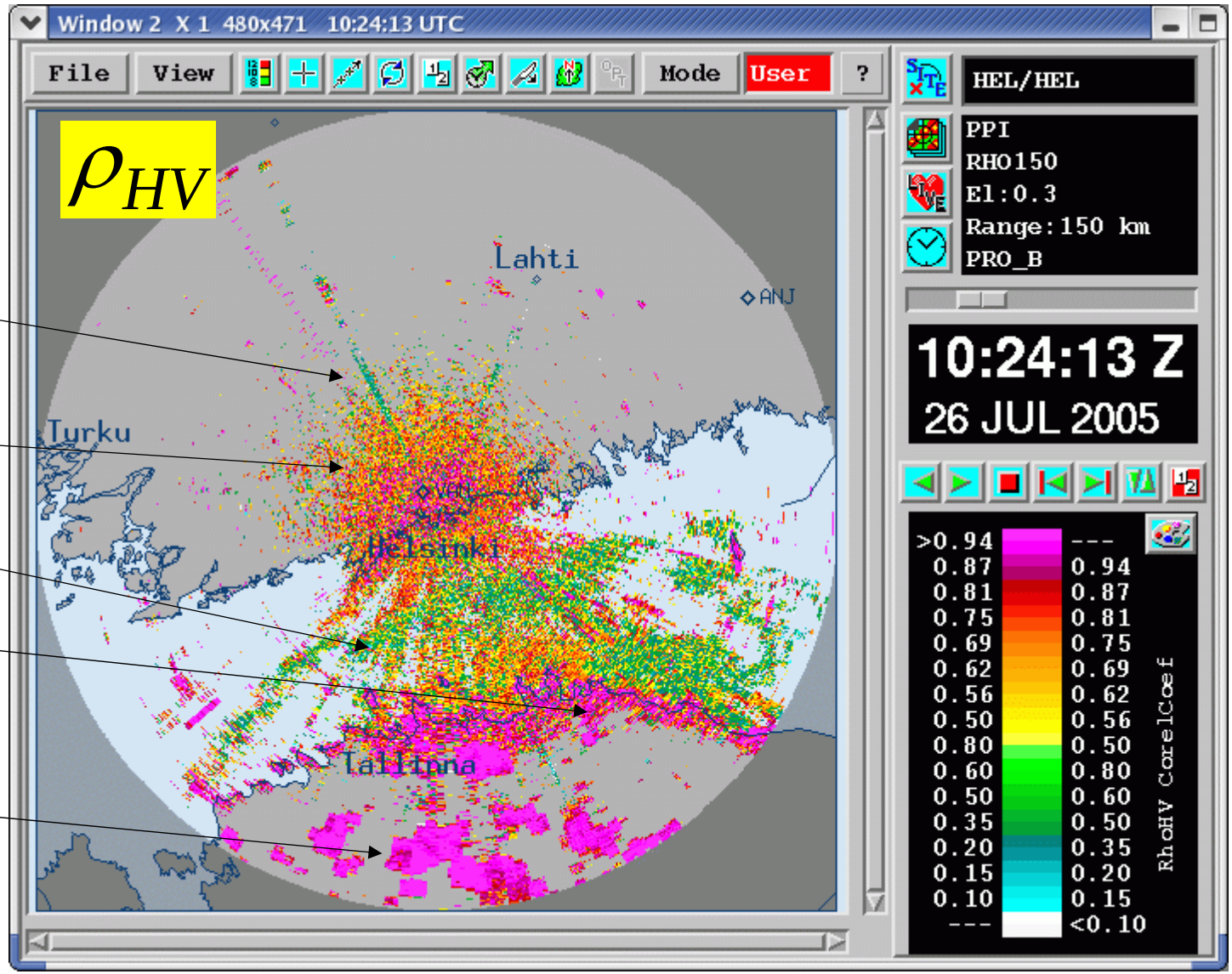
Inter-ference

Birds & insects

Sea clutter

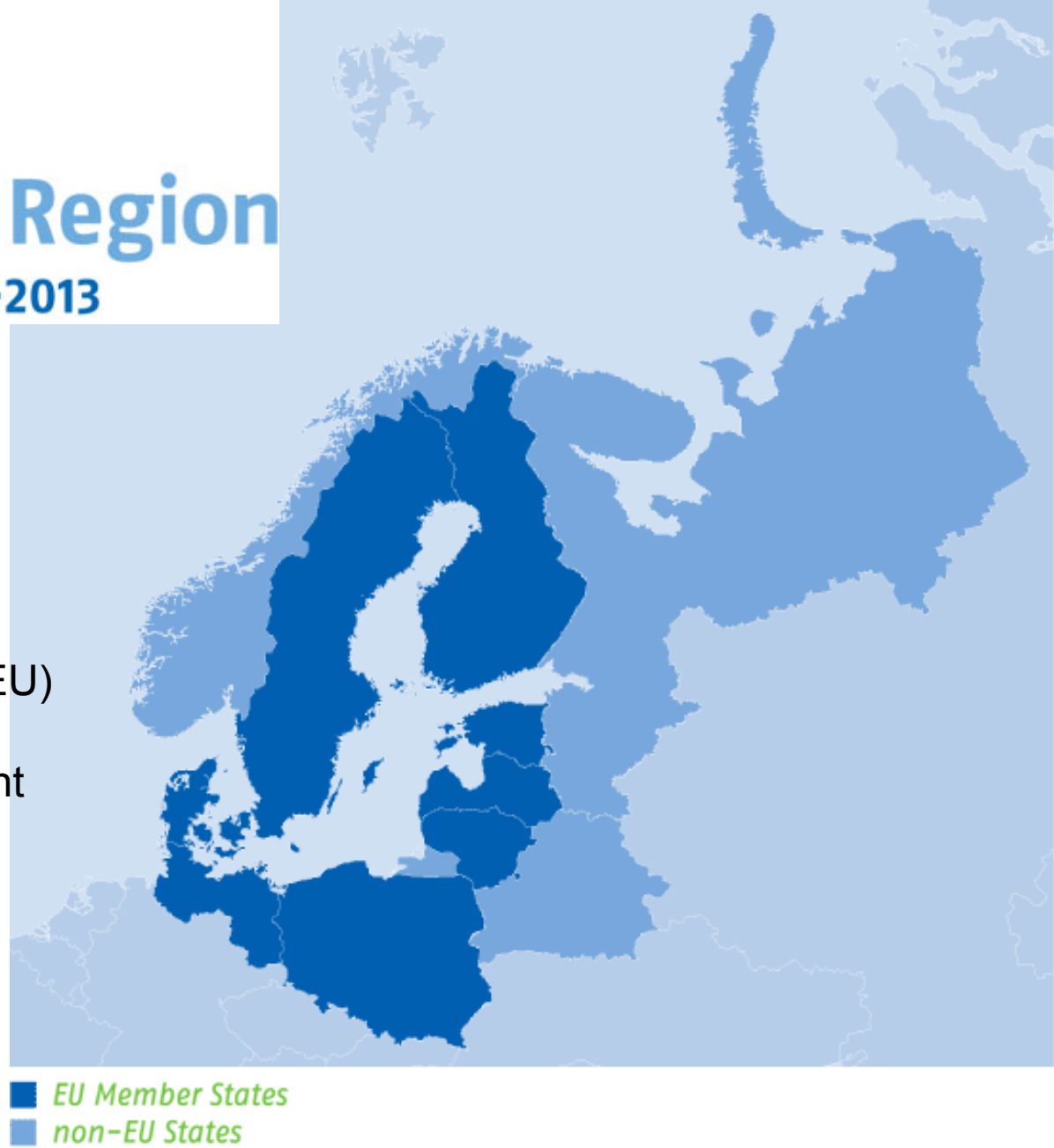
Ground clutter (anaprop)

Showers



Baltic Sea Region
Programme 2007–2013

- eu.baltic.net
- INTERREG IVB
- ~240 MEUR budget
- 1st call for proposals (25/2-30/5 2008)
- European Regional Development Fund (EU)
- European Neighborhood Partnership Instrument (non-EU)
- BSR ***is not*** about research (Framework VII)
- BSR ***is*** about building & developing the region



An advanced weather radar network for the Baltic Sea Region: BALTRAD

Baltic Sea Region Programme 2007–2013

Based on experiences from:

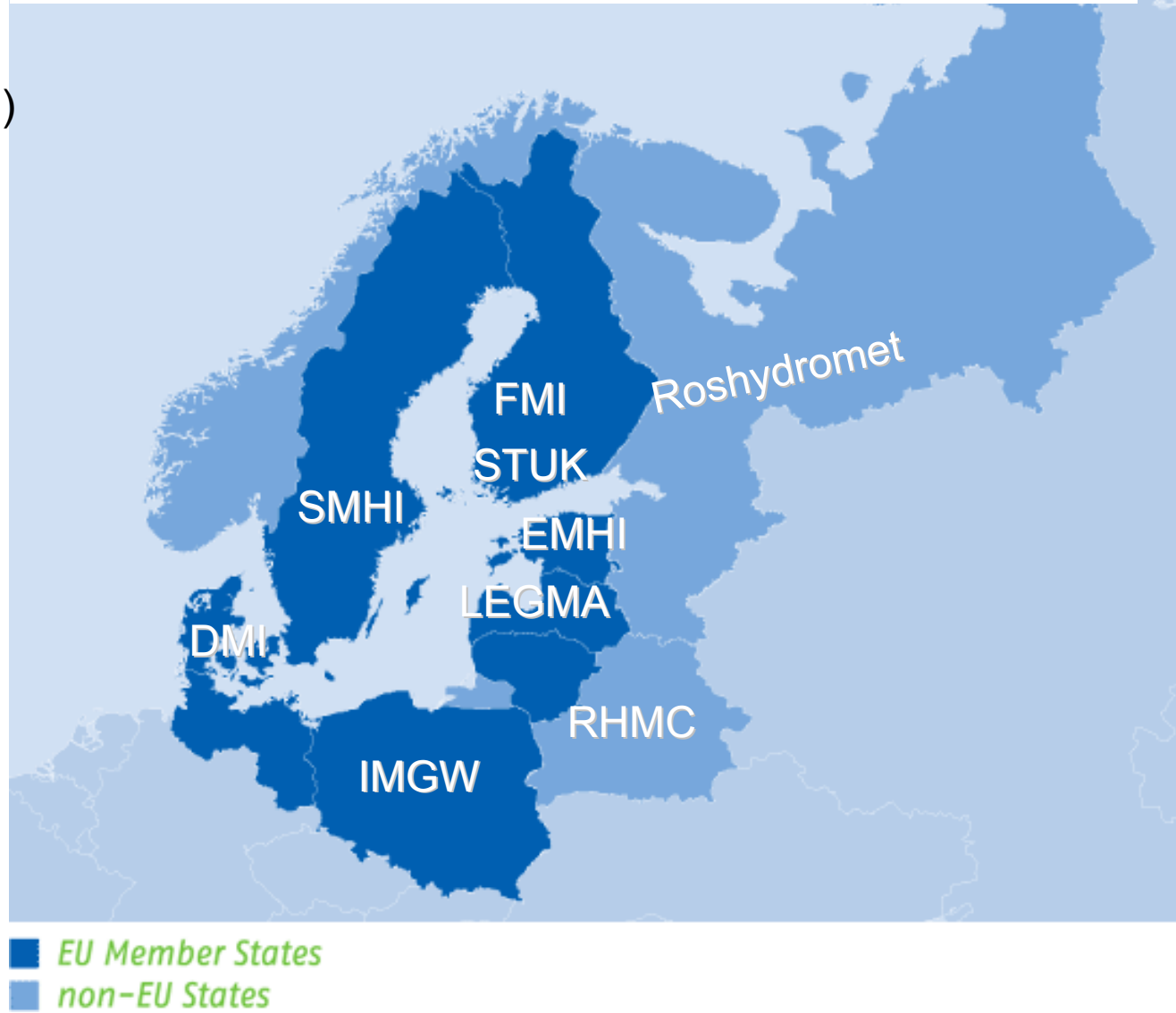
- NORDRAD
- BALTEX (WGR, BRDC, BALTRAD)
- BWRW
- NORA
- domestic expertise

BALTRAD
FULL PARTNERSHIP
MEMBERS

Old EU members
(DK, FI, SE):
75% co-funding

New EU members
(EE, LV, PL):
85% co-funding

ENPI (RU, BY):
90% co-funding



See BALTEX Newsletter, Dec 2008!
Time frame: 2009-2011
Budget: 2.2 MEUR
Work load: 32.2 FTE years

Work packages:
1. Project Management and Administration (mandatory, SMHI, Coordinator Daniel Michelson)
2. Communication and information (mandatory, FMI)
3. Core network (IMGW)
4. Data catalogue (EMHI)
5. Production framework (FMI)
6. Deployment (SMHI)
7. Pilots (IMGW)

FEATURES: polar data, WIS standard for radar, HDF5, quality methods throughout, **harmonized exchange and production**, relevance to OPERA and BALTEX

Future of WGR

- **The use of BRDC data in research has been relatively small compared to the total effort required (regular users ~10)**
- **BRDC operation is dependent on one person (Daniel)**
- **Production systems generated by BALTRAD may possibly take over the present BRDC production in future. Archive of BRDC products?**
- **At the moment WGR is almost hibernating as a BALTEX instrument although some of its members are active in national and international R&D efforts.**