LROSE and Research training program

Day 1

Introduction to the basic principles of weather radar and provides an overview of the LROSE software.
Outcomes: Participants will have a strong foundational understanding of both topics and the ability to navigate the LROSE interface.

Time	Content	Instructor
09:00-10:30	**Understanding weather: radar concepts and application** • Explore basic principles behind weather radar, including how it works and its various uses in meteorology. • Discuss key radar concepts and applications, such as tracking storms, precipitation detection and improve forecasting capabilities.	Roelof Bruintjes
	Tea	
11:00-12:30	**Introduction to LROSE: Overview and Capabilities** • Introduction to LROSE (Lidar Radar Open Software Environment) • Learning functionality and how to process the radar data • Application in operational and research settings for radar data analysis.	Roelof Burger
	Lunch	
14:00-15:00	**Practical: Getting started with the Rview interface** • Hands-on experience with Rview interface, a tool for visualizing radar data within LROSE • The exercises will teach participants how to navigate the interface and perform basic data visualization tasks, setting the stage for more advanced radar work.	Roelof Burger

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Day 2

Technical aspects of LROSE, including installation, configuration, and product generation.
Participants will set up and tailor the software for specific weather radar tasks.

Time	Content	Instructor
09:00-10:30	**LROSE Installation: Setting up the software environment.** • Installation of LROSE in a Linux environment. • Guidance of the installation process, including system requirements, step-by-step setup instructions and troubleshooting tips ensuring software runs smoothly.	Roelof Burger
	coffee	
11:00-12:30	**LROSE Configuration: customizing for your needs.** • Configure LROSE based on specific requirements. • Customizing software for different radar data processing tasks, including parameter adjustments and optimizing workflow.	Roelof Burger
	lunch	
14:00-15:00	**Practical: Generating weather radar products with LROSE.** • Apply their configuration skill to create a basic radar product using LROSE. • Walkthrough the process of generating useful outputs from the raw data, solidifying participants understanding.	Roelof Burger

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Day 3

Focus understanding the different types of radar products and how they are applied in fields such as nowcasting, hydrology and disaster management.

Time	Content	Instructor
09:00-10:30	• Explore radar products used for **nowcasting** and **early warning systems**. • Highlighting the role of radar in predicting • Severe weather such as thunderstorms and flash floods. • How radar products help provide timely and accurate warnings.	Roelof Bruintjes
	Tea	
11:00-12:30	**Radar products for hydrology and specialised sectors.** • How products are applied in hydrology and other specialised sectors such as agriculture and water management. • Learn to use the radar to estimate rainfall and monitor water resources, with sector-specific applications.	Roelof Burger & Roelof Bruintjes
	lunch	
14:00-15:00	**Practical Nowcasting and rainfall estimation.** • Conduct exercises focused on nowcasting and radar-based rainfall estimation. • Provide a real-world context, reinforcing the understanding of effectively using the radar data.	Roelof Burger & Roelof Bruintjes

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Day 4

Introduction to the advanced concept of dual-polarisation radar, which enhances the traditional radar by providing detailed information about precipitation types and storm structures.

Time	Content	Instructor
09:00-10:30	**Theory of dual-polarisation radar: An overview** • Science behind dual-polarisation radar, which measures both horizontal and vertical dimensions of precipitation particles. • Dual-polarisation technology that provides more accurate data for classifying precipitation, improving the overall radar forecast.	Roelof Bruintjes
	coffee	
11:00-12:30	**Dual-polarisation radar products: Application and interpretation.** • Explore assorted products generated by dual-polarisation radar and their practical applications. • Interpret dual-polarisation data for severe weather events such as hailstorms and heavy rain and how to use the product for decision making.	Roelof Bruintjes
	lunch	
14:00-15:00	**Practical: Interpreting dual-polarisation data.** • Analyse dual-polarisation dataset to interpret key variables and understand its application in real-time farecasting. • Reinforce theoretical knowledge gained earlier in the day through hands-on data analysis.	Roelof Bruintjes

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Day 5

Integrating radar data with other meteorological tools and systems. Integration is essential for building comprehensive forecasting and disaster risk reduction strategies.

Time	Content	Instructor
09:00-10:30	**Addressing limitations of weather radar.** • Limitation of weather radar range, beam blockage and data contamination from clutter. • Strategies to overcome these challenges and improve accuracy and reliability of radar-based forecasts.	Roelof Bruintjes
	coffee	
11:00-12:30	**Radar integration for disaster risk reduction and early warning.** • Learn how to integrate radar data into disaster risk reduction frameworks and early warning systems. • Explore benefits of combining radar data with other meteorological data sources such as satellite and ground-based observations to enhance the detection and communication of severe weather threats.	Roelof Bruintjes & Roelof Burger
	lunch	
14:00-15:00	**Practical: Using radar in research and multi-source systems.** • Final practical session where participants will work with examples of how radar data is used in research and multi-source meteorological systems. The focus is on combining radar with other observational tools to create comprehensive weather analysis, drawing real-world case studies.	Roelof Burger