Measuring Wind & Rain in the Atmosphere

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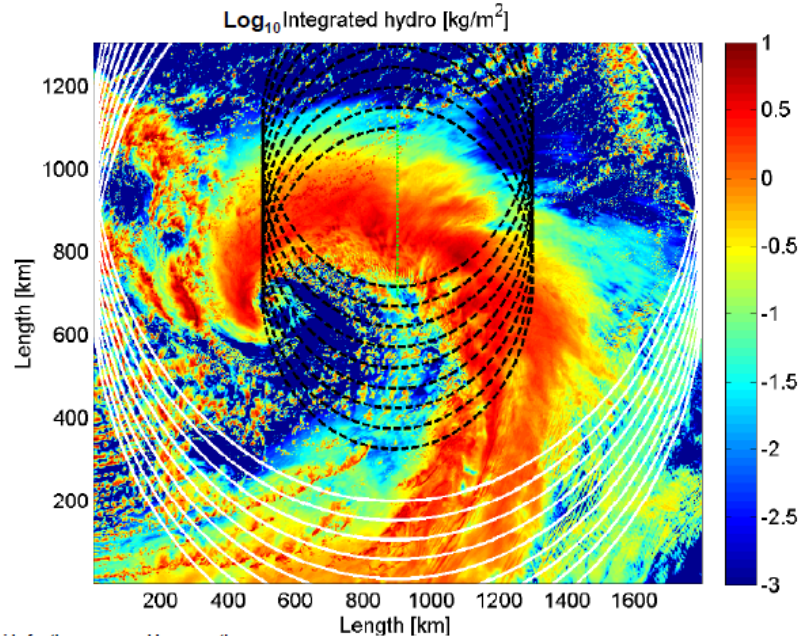
- Global measurements of wind and rain are important for weather forecasting and climate modelling.
- We measure surface winds using specialized radars & reflected navigation signal receivers that determine ocean roughness. However, this does not work over land, and the atmosphere is 3-dimensional with different winds at different heights.
- We can look at cloud motion with imaging instruments, but we need to know what is happening inside clouds, and in cloud free areas.
- For this we need active instruments such as LIDAR (e.g. ESA's Aeolus), and radars tuned to detect the rain and ice particles in clouds and how fast they are moving.



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Measuring Wind & Rain in the Atmosphere: Technology

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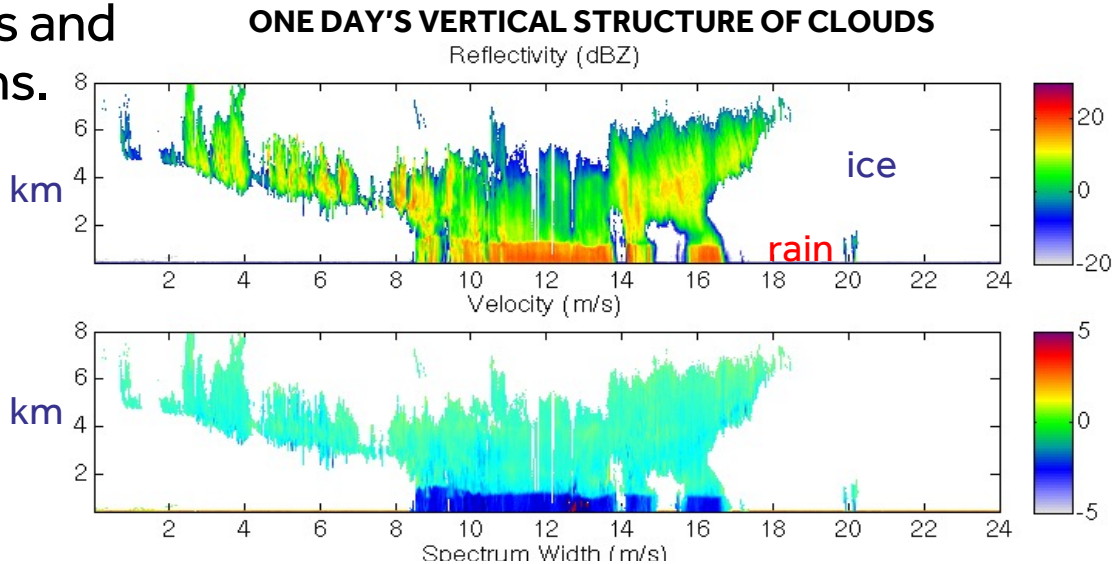
- The CEOI and UKSA have been supporting the University of Reading's wind and rain project, which has developed a narrow beam 94GHz radar which will measure wind speeds within clouds and rainfall.
- This radar is operating at the STFC Chilbolton observatory in Hampshire looking upwards and gathering data on passing weather systems.
- It is proposed to deploy a version of this radar on a spacecraft using a large conically scanning antenna. This concept is known as WIVERN.



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Measuring Wind & Rain in the Atmosphere: WIVERN

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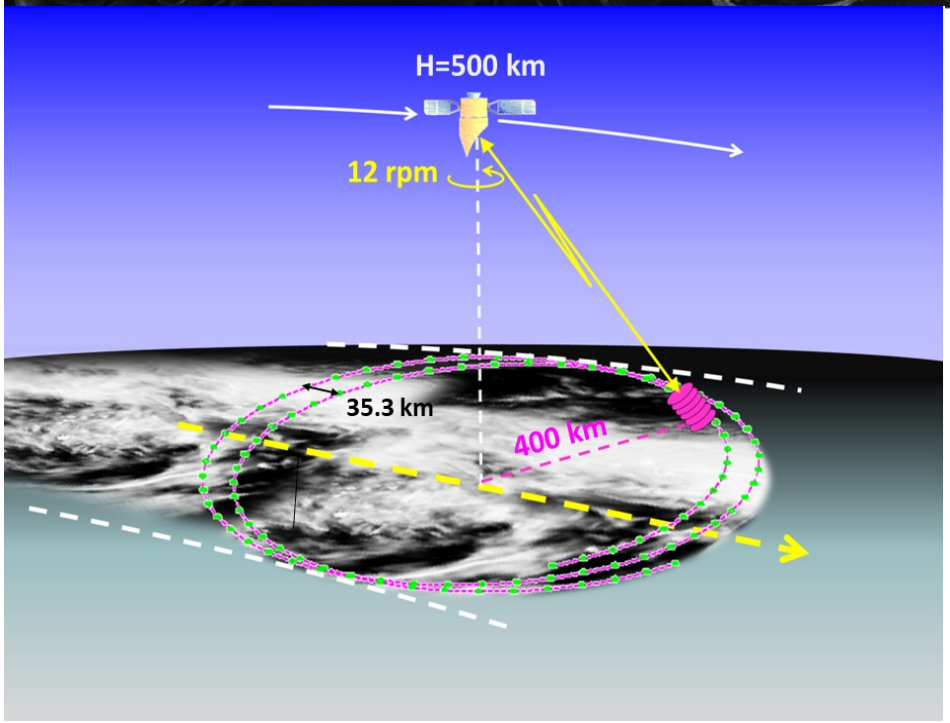

- The WIVERN mission has been selected by ESA for Preliminary (Phase 0) study, which means that the concept will be developed further with a view to a future spaceflight but will be competing with other missions also under study.
- The selection for a mission will depend upon, technology readiness, scientific readiness, and projected cost.
- WIVERN will help improve global models of wind and rain used in forecasts. The same models are used for climate and so make predictions of future climate more reliable.

More information

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UKRI Science and Technology Facilities Council

RAL Space

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University of Reading

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