



ESA's candidate core explorer mission CoReH2O: A satellite mission dedicated to snow and ice research

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The European Space Agency has released the call for the next Earth Explorer Core Mission Ideas in March 2005 with the aim to select the 7th Earth Explorer mission to be launched in the next decade. Twenty-four proposals were received and subject to detailed scientific and technical assessment. In the so-called Phase 0, six concepts have been selected and further investigated. A down-selection was made after the User Consultation Meeting held in Lisbon, Portugal in January 2009. Three candidate mission concepts are now being further investigated in the feasibility and consolidation phase (Phase A), after which the 7th Earth Explorer will be selected. The candidate missions under consideration are:

- BIOMASS - Global measurements of forest biomass and extent,
- CoReH2O - (Cold Regions Hydrology High-resolution Observatory) – Detailed observations of key snow, ice and water cycle characteristics,
- PREMIER - (PRocess Exploration through Measurements of Infrared and millimetre- wave Emitted Radiation) – Understanding the processes that link trace gases, radiation, chemistry and climate in the atmosphere.

This paper focuses on describing the CoReH2O candidate. The main objectives of this proposed mission are to observe snow water equivalent, to improve the modeling of snow and ice processes, and to advance the prediction of stream flow in regions where snow and glacier melt are important components of the water balance.

Snow cover and glaciers are not only key components of the water balance in high latitudes, but are also vital resources of fresh water for many densely populated areas at mid and low latitudes. In many regions the availability of this resource is seriously threatened by climate change, but details on the expected magnitude and patterns of changes in snow-water storage are largely unknown, and so CoReH2O addresses these deficiencies. A dual frequency SAR, operating at X-band (9.6 GHz) and Ku-band (17.2 GHz), VV and VH polarizations, with a swath width of about 100 km, has been selected for this mission. It will operate in two consecutive mission phases to deliver snow and ice information over two temporal scales (3 days and 12-15 days).

The presentation will focus on the ongoing scientific preparatory activities and campaigns in the framework of the mission and report on the outcome of a dedicated workshop planned for April 2010 in Innsbruck, Austria (Workshop on Cold Regions Hydrology, see <http://www.congrex.nl/10c06/>).