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The CIMR mission and its unique capabilities for soil moisture sensing

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The Copernicus Imaging Microwave Radiometer (CIMR) mission is currently being developed as a High Priority Copernicus Mission to support the Integrated European Policy for the Arctic. Due to its measurement characteristics, CIMR has exciting capabilities to enable a unique set of land surface products and science applications at a global scale. These characteristics go beyond what previous microwave radiometers (e.g. AMSR series, SMAP and SMOS) provide, and therefore allow for entirely new approaches to the estimation of bio-geophysical products from brightness temperature observations. Most notably, CIMR channels (L-,C-,X-,Ka-,Ku-bands) are very well fit for the simultaneous retrieval of soil moisture and vegetation properties, like biomass and moisture of different plant components such as leaves, stems or trunks. Also, the distinct spatial resolution of each frequency band allows for the development of approaches to cascade information and obtain these properties at multiple spatial scales. From a temporal perspective, CIMR has a higher revisit time than previous L-band missions dedicated to soil moisture monitoring (about 1 day global, sub-daily at the poles). This improved temporal resolution could allow resolving critical time scales of water processes, which is relevant to better model and understand land-atmosphere exchanges and feedbacks. In this presentation, new opportunities for soil moisture remote sensing made possible by the CIMR mission, as well as synergies and cross-sensor opportunities will be discussed.