Soil moisture retrieval from P-band microwave radiometer observations

Applications are invited for a 3 year PhD scholarship within the Water Group of the Department of Civil Engineering at Monash University, on an exciting project focusing on soil moisture retrieval from tower-based and airborne P-band microwave radiometer observations. The project is funded by the Australian Research Council.

The Project

Accurate soil moisture data in the root zone are critical to agriculture especially food production. Soil moisture status in near-real-time is critical for cropping, grazing, and irrigation management. Moreover, soil moisture information is essential to providing information on drought severity and extent to support relief claims for drought exceptional circumstances, and to predict likely flow-on effects in food availability. Soil moisture is also an important boundary condition in weather and climate prediction, providing important information on both short and long-term rainfall and heat-waves. Furthermore, monitoring of soil moisture data will afford a greater understanding of the water resource impacts from global climate change and variability.

Passive microwave remote sensing has been widely acknowledged as the most promising approach to monitoring soil moisture at regional and global scales. However, a current fundamental limitation is that this technique can only provide moisture information on the top 5 cm layer of soil at most, being one-tenth to one-quarter of the wavelength; e.g. 21 cm at L-band; 1.4 GHz using the current soil moisture dedicated satellite missions of NASA and ESA. Consequently, this project will use P-band (40 cm; 750 MHz) radiometer observations from long-term tower-based monitoring and intensive airborne field experiments to demonstrate a new state-of-the-art satellite concept of retrieving water content for the top 15 cm layer of soil.

The Opportunity

This position is for 3 years fulltime research towards a PhD. A tax-free stipend ($25,849 per annum) is provided. There is potential for the applicant to earn additional money through assistance in undergraduate teaching. Attendance at both national and international conferences will be expected and funded during the course of the degree. The applicant will work with an internationally recognized research group specializing in remote sensing and water management.

Candidates must meet the eligibility criteria for PhD. candidature at Monash University: http://www.monash.edu.au/migr/apply/

Selection Criteria

The successful candidate must meet ALL of the following criteria:

1) Bachelor of Engineering or Science with Honours.

2) An excellent academic record.

Furthermore, the candidate should have an interest in (microwave) remote sensing applied to hydrology, proficiency in maths, physics, computer programming and GIS, excellent oral and

written communication skills, and the ability to work efficiently alone as well as in a team. Experience with and interest in monitoring station maintenance and field experiments is essential.

Enquiries

Prof. Jeffrey Walker,

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Applications

Applications should include:

1) Cover letter, specifying interests, qualifications and experience as it relates to the project.

2) Curriculum vitae which should include employment history, details of journal publications, and the names of two academic referees.

3) A certified copy of you academic transcript.

Applications should be sent to jeff.walker@monash.edu

Closing date

January 31, 2017