

Plantenna: towards a network of vegetation-integrated sensors for plant and environmental monitoring

ten Veldhuis, Marie-claire; Uijlenhoet, R.; Schmitz, Jurriaan; Smolders, Bart; Nauta, Bram; Baltus, Peter; Makinwa, Kofi; Steeneken, Peter

Publication date

2019

Document Version

Final published version

Citation (APA)

ten Veldhuis, M., Uijlenhoet, R., Schmitz, J., Smolders, B., Nauta, B., Baltus, P., Makinwa, K., & Steeneken, P. (2019). *Plantenna: towards a network of vegetation-integrated sensors for plant and environmental monitoring*. Poster session presented at EGU General Assembly 2019 , Vienna, Austria.

Important note

To cite this publication, please use the final published version (if applicable). Please check the document version above.

Copyright

Other than for strictly personal use, it is not permitted to download, forward or distribute the text or part of it, without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license such as Creative Commons.

Takedown policy

Please contact us and provide details if you believe this document breaches copyrights. We will remove access to the work immediately and investigate your claim.



Plantenna: towards a network of vegetation-integrated sensors for plant and environmental monitoring

Marie-Claire ten Veldhuis (1), Remko Uijlenhoet (2), Jurriaan Schmitz (3), Bart Smolders (4), Bram Nauta (5), Peter Baltus (4), Kofi Makinwa (6), and Peter Steeneken (7)

(1) Delft University of Technology, Watermanagement Department, Delft, Netherlands (j.a.e.tenveldhuis@tudelft.nl), (2) Wageningen University, Hydrology and Quantitative Water Management Group Department of Environmental Sciences, (3) University of Twente, MESA+ Institute for Nanotechnology, (4) Eindhoven University of Technology, Mixed-signal Microelectronics, Electrical Engineering, (5) University of Twente, Electrical Engineering, (6) Delft University of Technology, Department of Microelectronics, (7) Delft University of Technology, Dept. Precision and Microsystems Engineering & Kavli Institute of Nanoscience Faculty 3mE & TNW

The aim of PLANTENNA is to develop vegetation-integrated, energy harvesting, autonomous sensors that measure in-plant and environmental parameters at high resolution and low cost. Sensor information will be used to develop methods for early detection of plant-stress and environmental strain. This in turn will enable optimising water and nutrient application schemes for agriculture, improve drought protection and support decision making for environmental protection and climate resilience.

Plantenna is a strongly multi-disciplinary research program that brings together sensor technology, electronics & communication research groups with plant and environmental scientists. New sensor technology and electronics will be developed using innovative techniques and materials for miniaturization, energy harvesting, wireless communication to enable sensor integration in and on plants with the goal to address these key scientific questions:

- How to use the physical, chemical and biological processes in plants for improved sensing of environmentally and agriculturally relevant parameters?
- How can plant energy be converted efficiently to drive integrated sensors & electronics?
- How to realize a fully autonomous, self-sustaining and low-cost cyberplant?
- Can an autonomous communication network be established between plants, in order to realize an Internet Of Plants?
- How to utilize such an Internet Of Plants for monitoring and predicting our environment: air, water, soil, flora, weather, climate, health of plants and food quality?