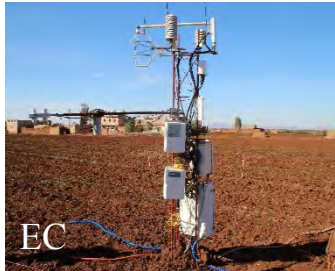


ALTOS KoF meeting

- Cadi Ayyad University UCA -
Tensift Site
WP2

April 20-21, 2020

Rainfed wheat functioning (2017-date)



Continuous measurements



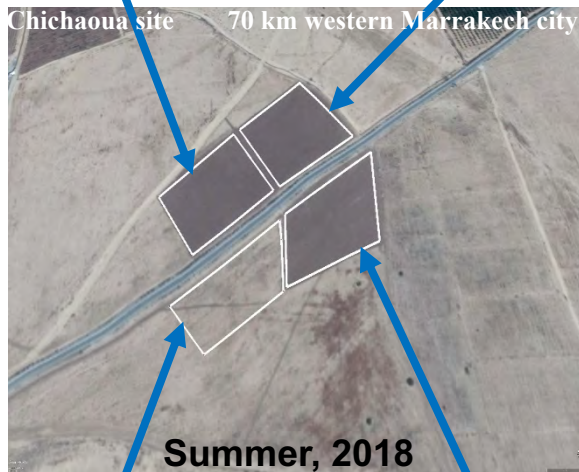
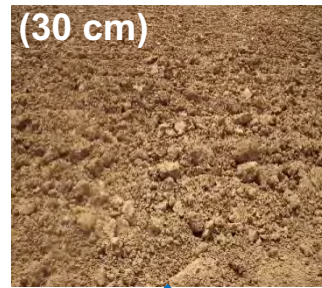
Field campaigns



Main objectives:

- Retrieving temporal variation of stress coefficient from f_c , LST and SM observations,
- Validation of ET-TSEB constrained by 1 km resolution MODIS LST, f_c and disaggregated SM-SMOS,
- Calibration of sentinel-1 data using optical/thermal data (Landsat 7/8).

Roughness and SMC measurements on bare soil



Surface soil moisture



Soil roughness



Main objectives:

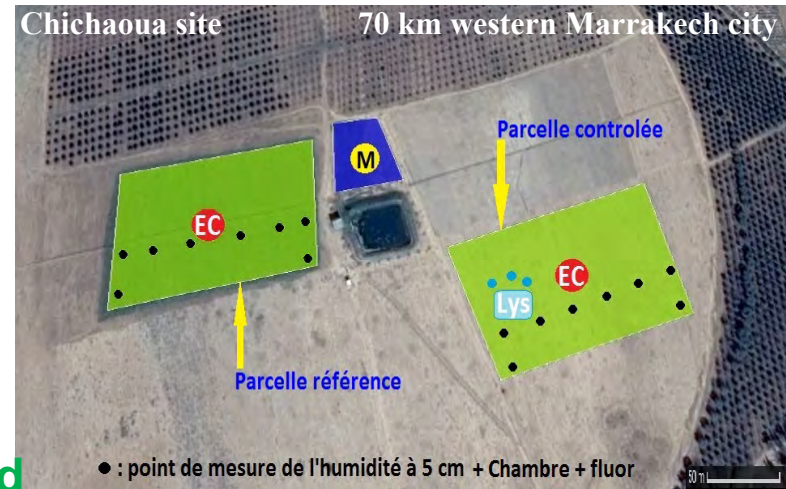
- Investigation of the effect of surface roughness on the radar signal (C-band) over bare soils,
- Comparison of the backscattering coefficient derived from 3 radar models (IEM, Oh and Ulaby model),
- Retrieving surface soil moisture by using these models and Sentinel-1 data.

Partitioning E/T and Crop water stress

Partitioning E/T: comparison/complementary between different sensors monitoring the surface water balance terms with various spatio-temporal resolutions,

➤ **Crop water stress:** measurement and characterization.

Measurement on stressed and non-stressed wheat :(2 EC, 3 smart lysimeters, sap flow systems, fluorimeter, PRI, gas chambers, porometer) + LAI, biomass, vegetation and soil water content ...



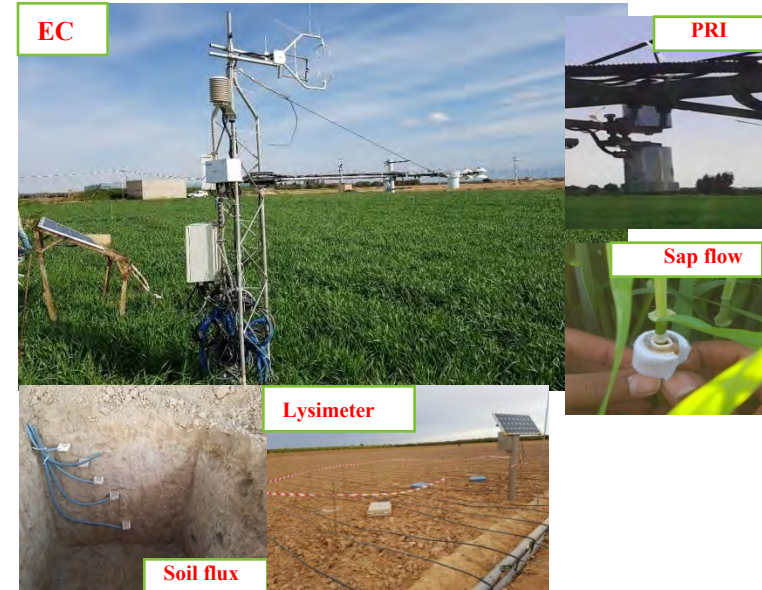
Porometer



Big gas chamber

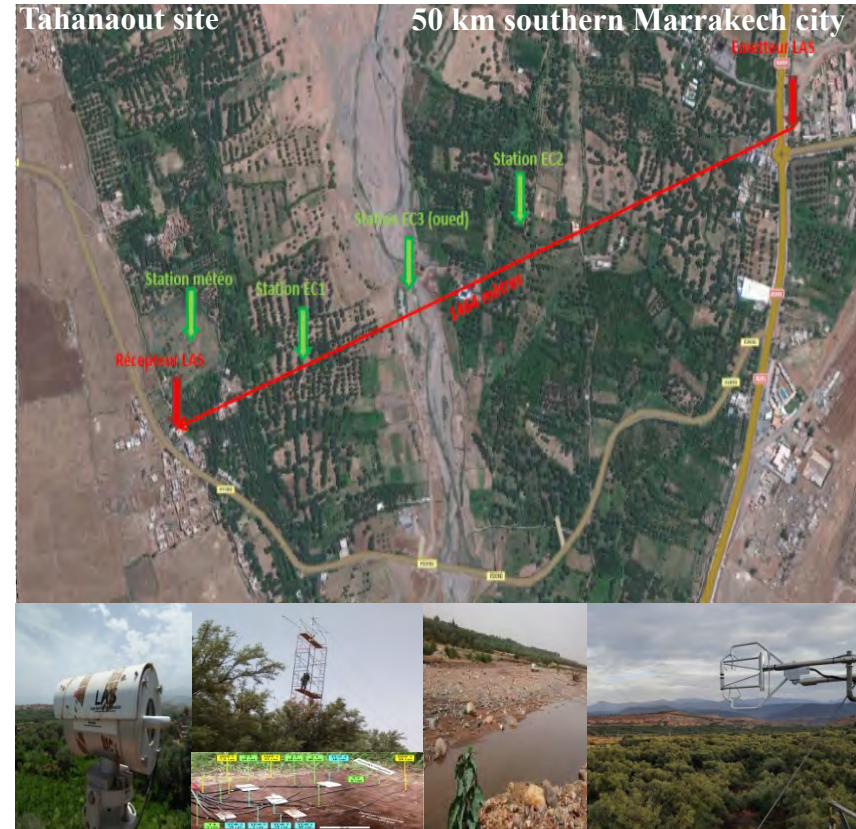


Small gas chamber



Hydrological functioning of the foot-mountain zone (2017-date)

- Evaluation of the ETR over the practiced heterogeneous covers,
- Extension of SAMIR Software,
- Estimation of deep percolation with water balance (groundwater recharge).



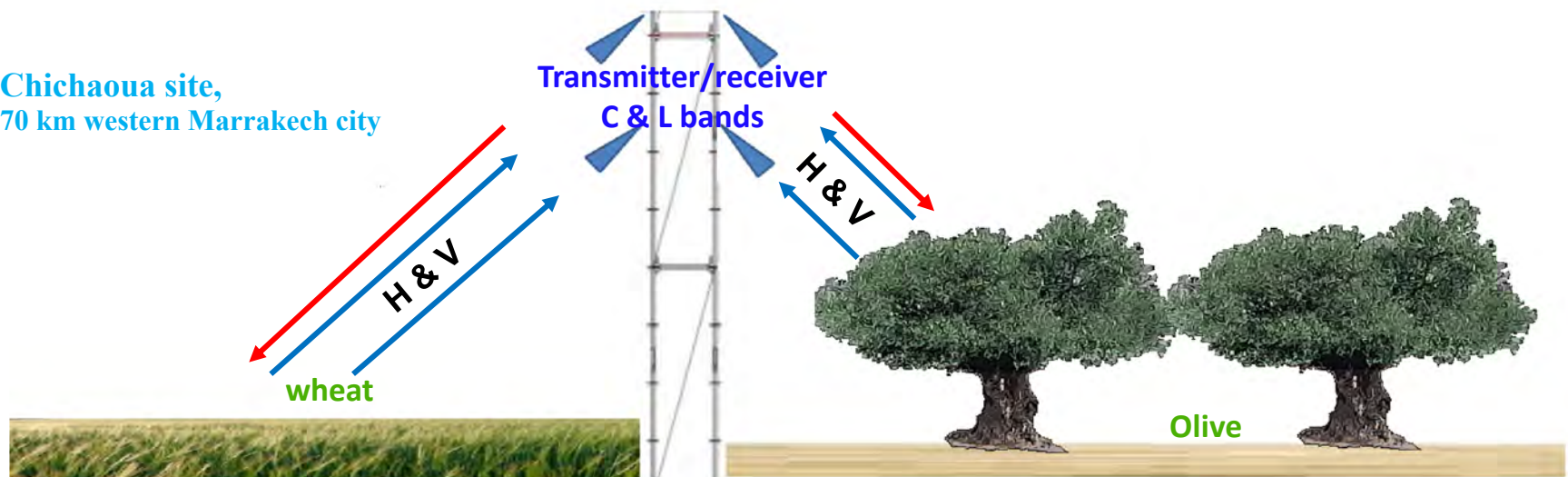
1 LAS (1.6km transect), 2 completes EC, 1 meteo station + OS, LAI

Observations des Cultures par Télédétection radAR

MOCTAR experiment (sentinel-1 mission): (2019-2022)

- Improve our understanding of the radar signal (C and L bands) on annual and perennial crops,
- Provide the key variables (biomass, soil moisture content) for monitoring evapotranspiration,
- Study the potential of Sentinel-1 data to monitor the crop water stress,
- Assessment of the complementary between the radar data (C and L bands) and optical data for piloting the crop models.

Chichaoua site,
70 km western Marrakech city



Surface soil moisture retrieving

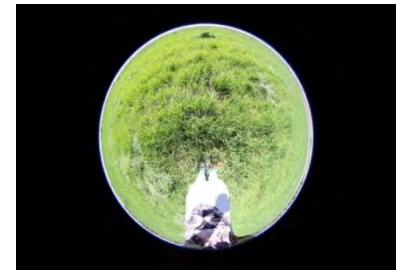
By using the machine Learning, backscattering models and the interferometric coherence

Chichaoua Site: data from 2016-date



Wheat measurement

- Biomass
- LAI
- Height
- Canopy cover



Soil Measurement

- Surface soil moisture
- Surface roughness (needle-profilometer)

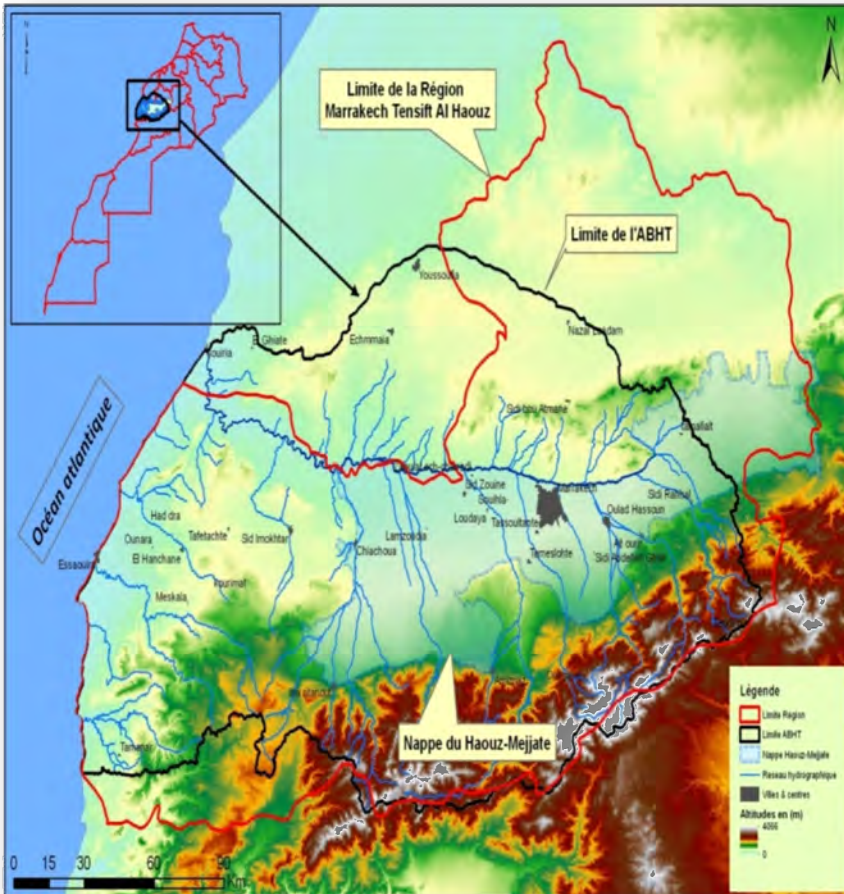


Meteorological data

- Rainfall
- Temperature



GROUNDWATER RECHARGE IN THE HAOUZ-TENSIFT BASIN



Objectives:

- Identification and characterization of groundwater recharge sources.
- Quantification of exchanged fluxes between surface water and groundwater.

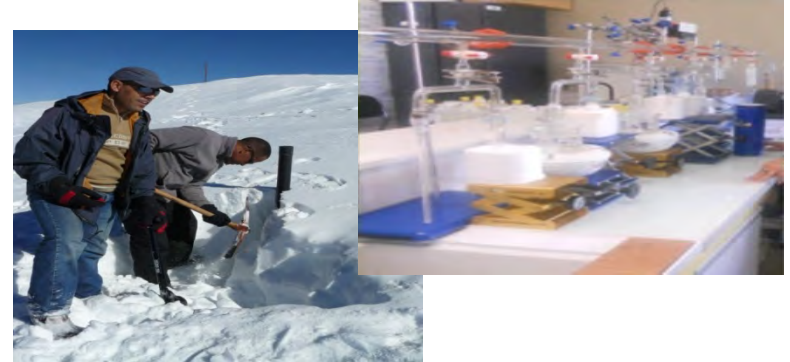
Tools :

- Hydrochemistry, isotopes and modeling

Snowmelt contribution to surface water and groundwater recharge resources

Methodology:

Isotope studies of the Atlas mountain snow.



The main goals:

- This project seeks to test the main hypothesis that determines the isotopic signal of rainfall, snowmelt, surface and groundwater at the watershed scale and develops an improved methodology to quantify the contribution of snow cover on water cycle at the basin scale,
- Integrating the north and south sides of the atlas series (both high and middle atlas), and sampling on many seasons.
- Integrating hydro-isotopic modelisation to quantify the recharge and having a clear idea of underground water resources,
- The velocity water transfer from upstream to downstream ought to be evaluated through two physico-chemical dating tools (Tritium measurements and Anthropic gases (Ccs, HCFCs, SF6))

Snow sublimation and soil evaporation on the High Atlas mountain

The main goals:

to better control the **water balance of mountain watersheds** and therefore the water resources supplying the Haouz plain.

Snow evaporation=?

Mountain soil evaporation=?

Methodology:

The experimental protocol consists of the installation of an **Eddy covariance system** and a device based on radio modems for data transmission on the **summit of Jbel Tazaghart (3850 m)** located in Toubkal park (*since summer 2020*).

