

Working Groupe 2

Advances and prospects in laboratory
measurements

Type of samples

Consolidated material	
Natural	Artificial
Sandstones Limestones Tuff Oil and gas shales Ore material Volcanic rocks	Bricks Sand limestones Concrete Grout (concrete + sand) Aerated concrete slag
Unconsolidated material	
Natural	Artificial
Sands Marine sediments Ancient river deposits	Domestic/ Mine wastes Sand + ore minerals mixtures Sand + clay mixtures Glass beads Colloids (gold, silver,...) Clay suspensions

Type of sample

Organic material

Wood

Peat

Charcoal

Tree/crop roots

Wooden material + sand

Organic contaminants+ sand + clay

Biofilms + glass beads

Archaeological buried wood

Questions

- Sample preparation?
- Verification of the measurement system?
 - Electronics?
 - Sample-holder?
 - Electrodes?

Sample preparation (unconsolidated mat.)

- Packing:
 - dry or wet ?
 - nature of the material: small or large particles?
 - close to the natural conditions?
 - Homogeneity?
- Do it every time the same way
 - > recipe: material dependent
 - > Experimental experience

 - > Homogeneity
 - > Visual check, multiple electrodes, CT
 - > Saturation
 - > from the bottom to the top

Verification of the measurement system?

- Electronics

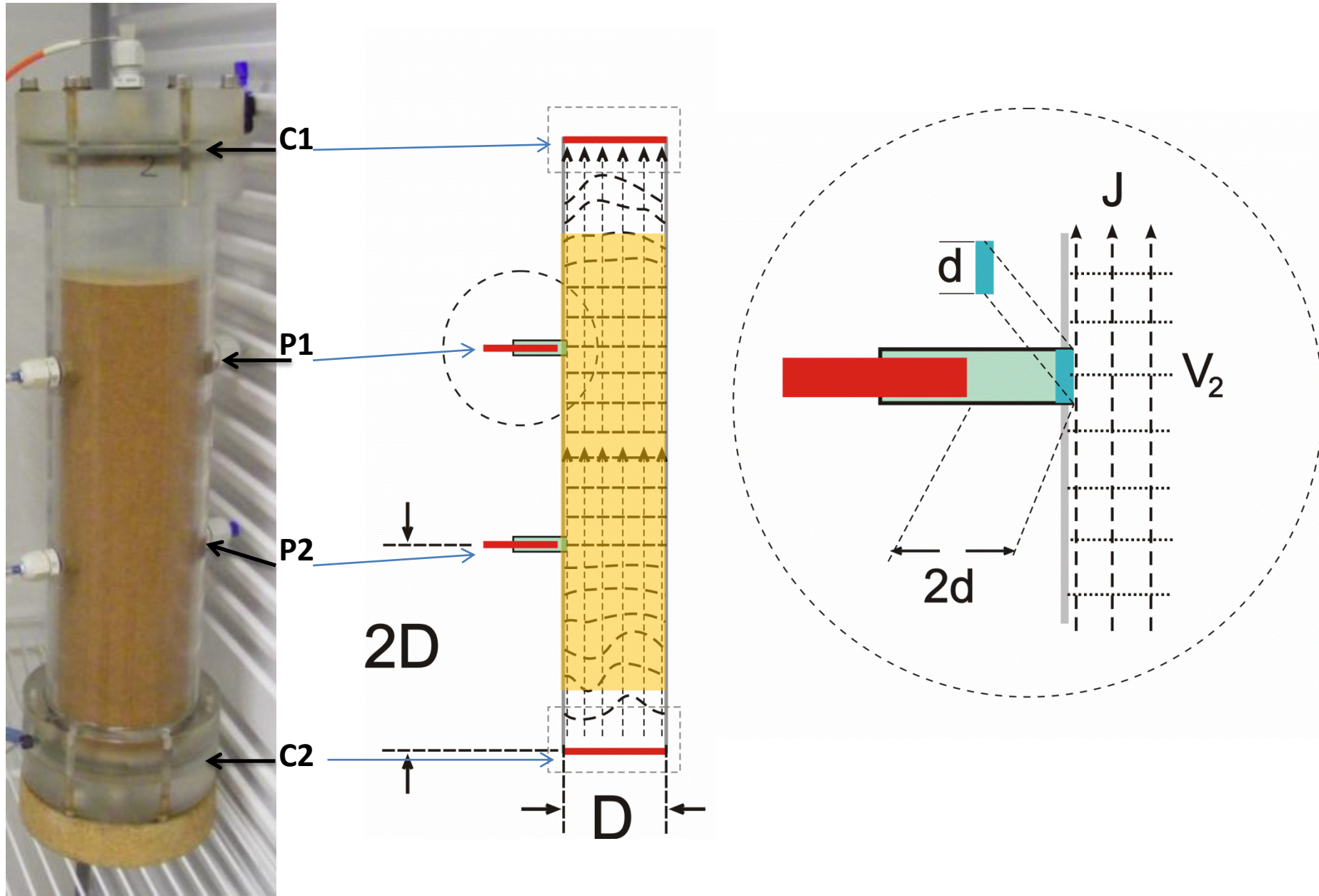
- Calibration:

- recommended manufacturer calibration

- Electronic circuit with R C

Verification of the measurement system?

Sample holder



Verification of the measurement system?

- Electrodes

M and N

- Outside the current path
- Non-polarizable
- NEED TO BE CLEAN
- Stable for the investigated material
- Point electrodes vs ring electrodes?

A and B

- Big surfaces: homogeneous potential distribution

Verification of the measurement system?

How to control parameters while measuring?

σ_w

T, P

θ_v

ϕ

pH, Redox Potential

Chemical reactions?

Current density monitoring?

Open questions

- Models :

Laboratory verification of existing/new models

- Need of a wide database
- Design suitable experiment to verify the models

- Clay/ organic interactions

role of bacteria? Type of clay? Fluid chemistry?

Open questions

- Extension to HF and LF?
 - > EM coupling for HF
- Current density?
 - > non linear behavior?

