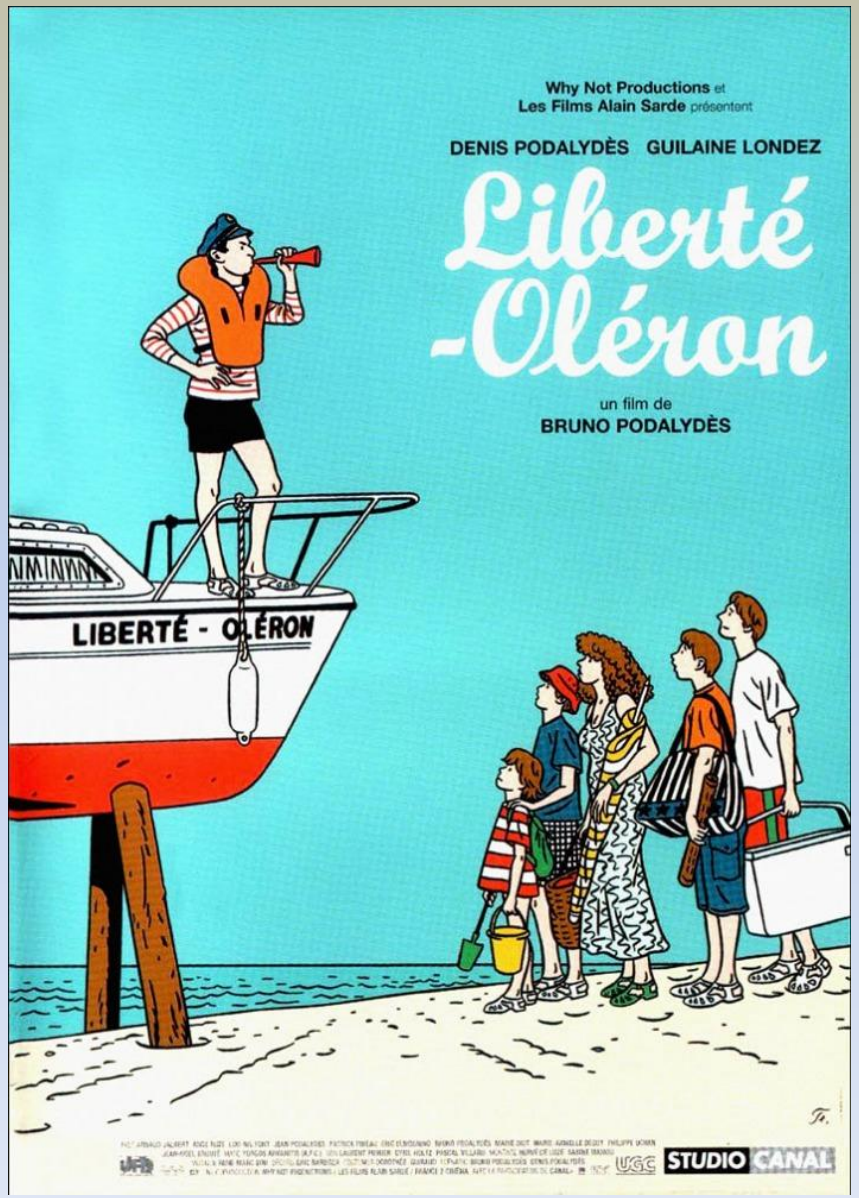
Progress in IP inversion



Point I: how many parameters

- 2 to 6 parameters max can be retrieved from IP data, depending on the involved frequency range

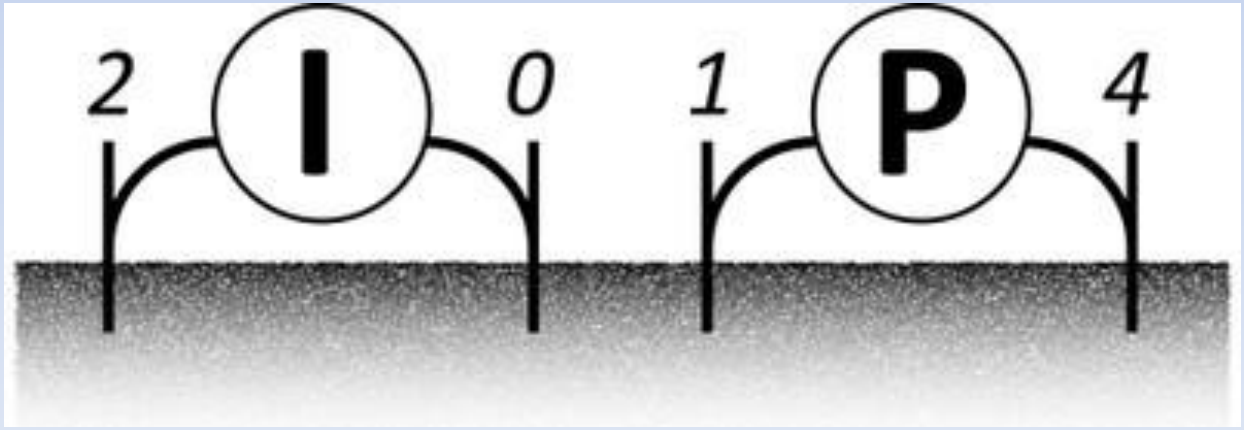
Max ~6 parameters ➔
-smooth RTD (6 points + spline, or 5 degree polynomial)
-Or 2 Cole-Cole (more or less)
-Or 2 Warburg
-Or 6 Debye (some parameters fixed…)

-1 parameter: ρ ➔ classical resistivity
-2 parameters : ρ, m or partial M..
-3 parameters: ρ, m, τ
-4 parameters: ρ, m, τ, c
-6 paramaters (examples): $\rho, m_1 m_2, \tau_1, \tau_2, c$
or 6 points in the spectrum + interpolator

Point I: how many parameters

- 1-D, 2-D or 3-D (+time lapse) inversion (with TD or FD as well)

It seems consensual that the inversion of the full data set in one unique computation is preferebale for robustness (global smoothing)



Point II: Anisotropy

A difficult problem, depending on object and community

1. we must acquire skills on field anisotropy effect on the observed data
2. How to measure if it is necessary to take into account anisotropy?
3. Can IP help to solve anisotropy equivalences we get in resistivity?

Point III: TD versus FD

Theoretically equivalent and codes are available.

BUT we feel better in limiting the data transformation from one domain to the other domain to limit the potential problems induced by the noise tranfer (propagation) from one domain to the other (lost of information on the noise).

Point IV: EM-IP concerns

-Taking into account (inverting) coupling in 1-D, 2-D and 3-D (full EM diffusion equation modeling). This will provide ability to enlarge the frequency range.

- (Only cables coupling in 1-D is already made by CR1DINV)

-Can loop source replace grounded current electrodes??

- Future ability to enlarge the frequency range

Point V: IP education

For the incoming generation, a « summer school » for student (from undergraduate to 77 old geophysicists) will be usefull to contribute to transmit knowledge and make IP a living science.

Next workshop:
- Summer school then workshop following?