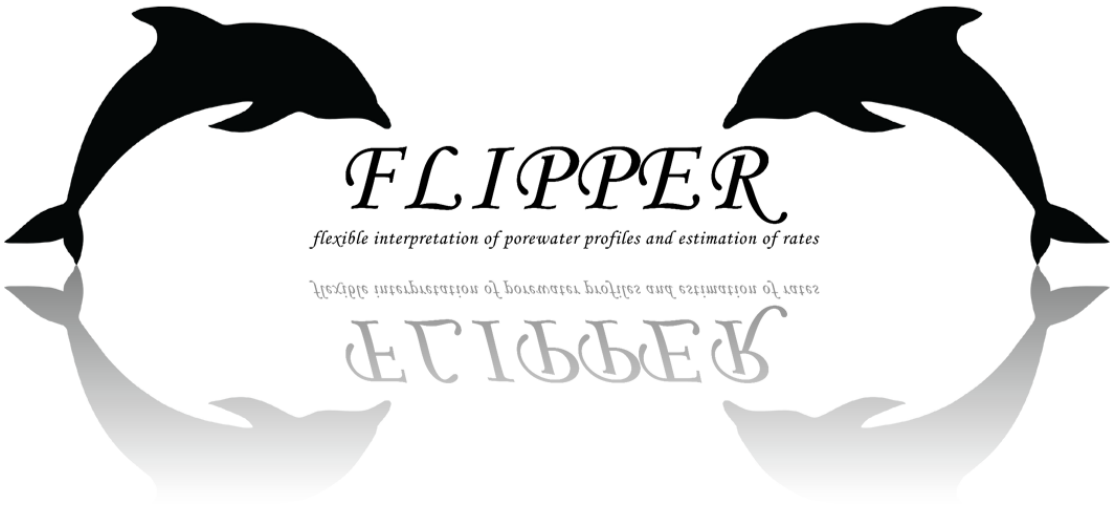
Team FLIPPER presents

A short manual for



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With input from:
... ...

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1 Introduction

Under construction

2 Required software and packages

FLIPPER is a series of functions and scripts to analyze porewater profiles of dissolved species. It is written in the R language, so you will need a functioning version of R and Rstudio. FLIPPER uses a series of R-packages that are essential for its functioning, so you need makes sure the following packages have installed on R:

- marelac
- signal
- fractaldim
- ReacTran
- marelac
- FME
- wavelets

3 FLIPPER

FLIPPER is called as follows:

```
FLIPPER.func(input,por.cte=NA,E.cte=NULL,tort.dep=1,species,method=NULL,
             env.parms=NULL,full.output=FALSE,
             discrete.parms=NULL,
             continuous.parms=NULL,
             gradient.parms=NULL)
```

At the bare minimum, you need to supply it with an input dataframe containing depth and concentrations and a porosity value (either as a constant value, or included in the input dataframe). All other arguments have default values that allow FLIPPER to run.

3.1 input dataframe

"input" is a dataframe that contains depth ('x' in m) and co

4 Output

5 References

References

[Roobaertetal.(2018)] Roobaert, A., Laruelle, G.G., Landschützer, P., and Regnier P.:Uncertainty in the global oceanic CO2 uptake induced by wind forcing: quantification and spatial analysis, Biogeosciences, 2018, 15:1701-1720. doi:10.5194/bg-15-1701-2018

Table 1: Most important FLIPPER parameters.
[1]Porosity has to be defined either in the input dataframe or as a constant value.
[2]Electrical field vector structure is c("value E","start depth of E","end depth of E"), where "start depth" is shallower than 'end depth".
[3]Only relevant if an electrical field is present.

Name	Structure	subname	Units	Required?
input	dataframe	'x' = depth	cm	required
		'C' = concentration	$mmol\, m^{-3}$	required
		'porosity' = porosity	-	optional[1]
		'E' = electrical field	$V\, m^{-1}$	optional
por.cte	scalar		-	optional[1]
E.cte	vector		$V\, m^{-1}$	optional[2]
tort.dep	integer	'1' = 1-2ln(por) (default)	-	optional
		'2' = por^1	-	optional
		'3' = por^2	-	optional
		'4' = 1+3(1-por)	-	optional
species	character	e.g. c("O2") for oxygen	-	required
method	character	"gradient" = only diffusive flux	-	optional
		"discrete" = only discrete analysis	-	optional
		"continuous" = only continuous analysis	-	optional
		"all" = all three methods (default)	-	optional
full.output	logical	TRUE gives all possible output	-	optional
		FALSE gives cleaned output (see section below)	-	optional
env.parms	list	'TC' = temperature	$\deg C$	optional
		'S' = salinity	-	optional
		'P' = pressure	bar	optional
		'Dmol' = diffusion coefficient	$m^{-2}d^{-1}$	optional
		'z' = charge of ion	-	optional[3]
discrete.parms	list	'i.end' = maximum number of zones to test	-	optional
		'initial.zones' = start zones to start lumping	-	optional
continuous.parms	list	'p' = order of polynomial to be fitted (typically 2 or 3))	-	optional
		'n.uniform' = logical, if TRUE then n.C, n.J, and n.R are all set uniform to max(n.C,n.J,n.R)	-	optional
gradient.parms	list	'x.limits' = depth limits of the profile (a vector of 2 -¿ the upper depth and the lower depth)	-	optional

[Wanninkhof(1992)] Wanninkhof, R.: Relationship between wind speed and gas exchange over the ocean, Journal of Geophysical Research, 1992, 97:7373-7382.

[Wanninkhof(2014)] Wanninkhof, R.: Relationship between wind speed and gas exchange over the ocean revisited, Limnology and Oceanography: methods, 2014, 12:351-362. doi:10.4319/lom.2014.12.351

[Weiss(1970)] Weiss, R.F.: The solubility of nitrogen, oxygen and argon in water and seawater, Deep-Sea Research, 1970, 17:721-735.

[WiesenburgandGuinasso(1979)] Wiesenburg, D.A., and Guinasso, N.L.: Equilibrium Solubilities of Methane, Carbon Monoxide, and Hydrogen in Water and Sea Water, Journal of Chemical and Engineering Data, 1979, 24:356-360.

6 FAQ and useful svn/linux commands