

# RheoWoodDB

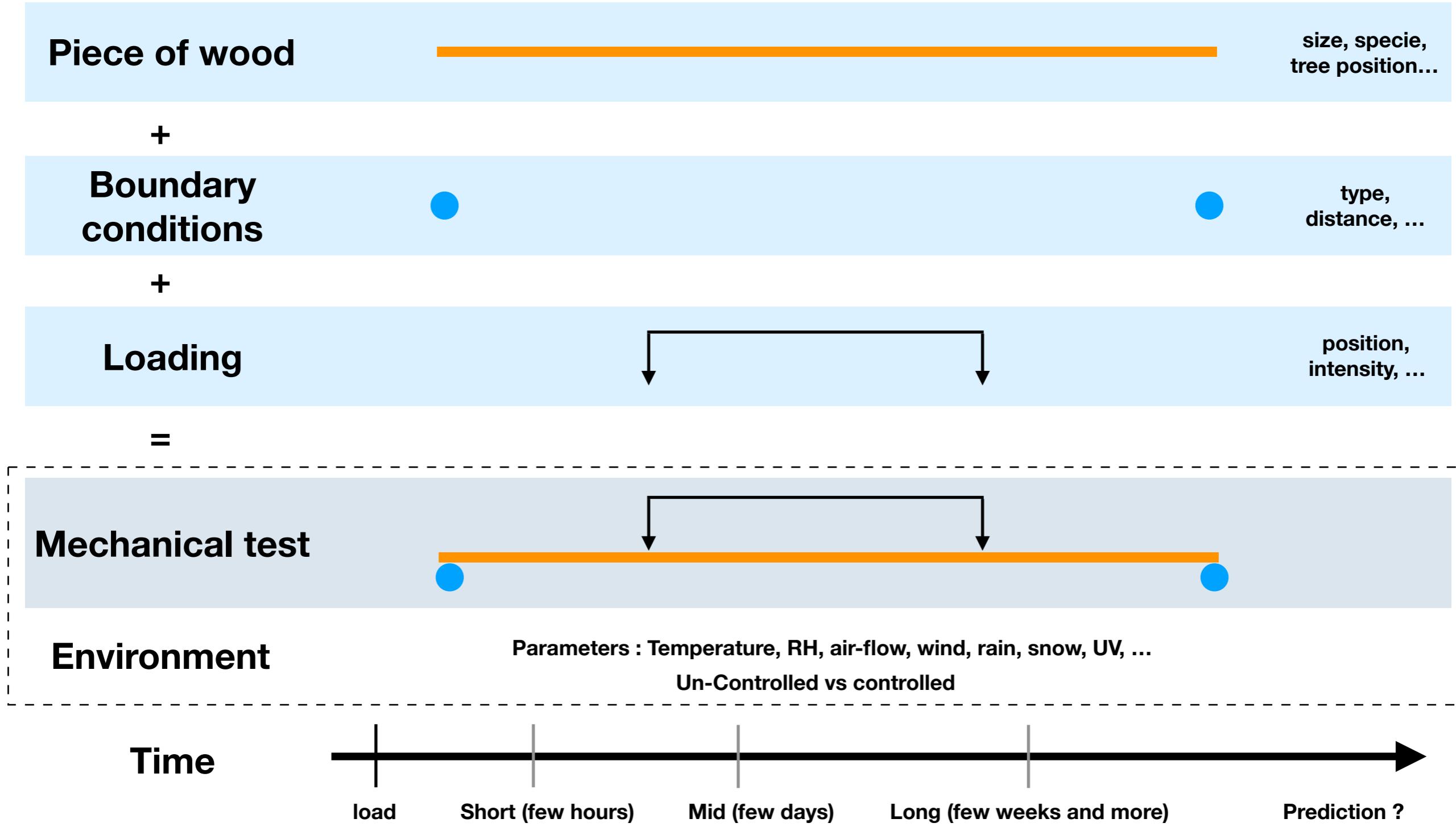
***A unified collection of scientific data on wood rheology***



## 9e Journées Scientifiques

Grenoble, 18-20/11/2020

# Wood rheology ... in brief : the bending example



+ material orthotropy

+ other sollicitations (tensile, shear, ...)



... have a nice experimental plan !

# Context up to the situation :

**Long, un-easy and sensitive to experiment, expensive ....**

**... but a partially describe phenomenon in the wood science community.**

Material axis	Sollicitation mode					
	Bending			Tensile	Compression	Shear
	3pts	4pts	others			Torsion
Longi.	Lopes & Matos, 2019	Kingston & Clarke, 1961	Hunt 1986	Schniewind & Barrett, 1972	Mohammed et al., 2019	Bhatnagar, 1969
	Dwianto et al., 2000	Hering & Niemz, 2012	Hunt 1987	Taniguchi et al., 2010	Dwianto et al., 2000	...
	Hogan & Niklas, 2004	Gnanaharan & Havgreen, 1979	Foudjet & Bremond, 1989	Peng et al., 2017	Keith, 1974	
	Nakai & Grossman, 1983	Moliński & Raczkowski, 1988	...	Kojima & Yamamoto, 2005	Bazant, 1985	
	Grossman & Kingston, 1954	Hoyle et al., 1984		Kojima & Yamamoto, 2004	Gnlnuhtrrun & Hcrygr-ren, 1978	
	Arima & Grossman, 1978	Armstrong & Grossman, 1972		Scheniewind 1966	...	
	Hearmon & Paton, 1964	Mukuday 1987		Scheniewind, 1972		
	Scheniewind 1967	Bengtsson & Kliger, 2003		Hunt, 1979		
	Raczkowski, 1969	Montero, 2012		Hunt 1984		
	Scheniewind, 1972	...		Hunt 1987		
	Ranta-Maunus, 1975			Engelund & Salmén, 2012		
	Gressel_1984			...		
	Clauser 1959					
	Ma et al., 2014					
	Leichti , 1988					
	...					
Radial	...	Hermawan & Fujiimoto. 2019	...		Scheniewind, 1972	
Tangential		Hermawan & Fujiimoto. 2019		Perkitny, 1965	Scheniewind, 1972	

\* incomplete list of references

# Context facing a problematic :

... however un-comparable results occurs !

even if we compare according to compliance level on  
similar moisture content and temperature.

Find a solution for a collaborative work...



MS Excel file is not suitable  
*(how to store and sort data sets, collaborate, etc)*



MS Access file is not suitable  
*(how to collaborate, display etc)*

# Proposition :

## A shared python-based software to collect, compare and model the rheological of wood

the more we work  
with the better we will  
fit our needs

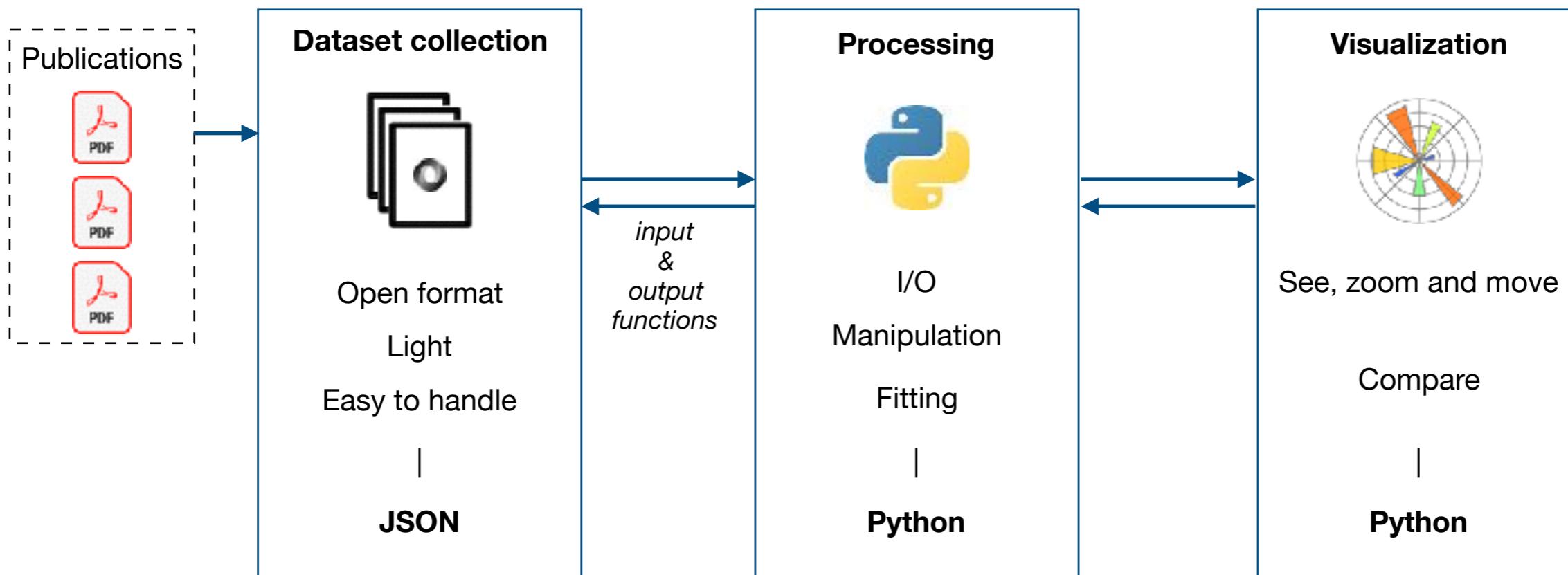
macro-langage (can  
read/write with other  
softwares), common  
(in science, lab...)

get data from  
articles, reports, or  
unpublished  
experiments  
(records, or  
digitalization of  
graphs)  
by different  
criterions

1D rheological  
models, ...

objective

## First attempt :



# Deeper look into a data



- Metadata informations :
  - reference (author, year, institute, doi, ...)
  - material (specie, size, tree position, ...)
  - test information
  - environment
  - ...
- Original data values :
  - Time range as original
  - Raw sollicitation
  - Raw measurement
- Computed data values :
  - Time range (in various time step)
  - Processed sollicitation
  - Processed measurement

Up to now ~130 data.

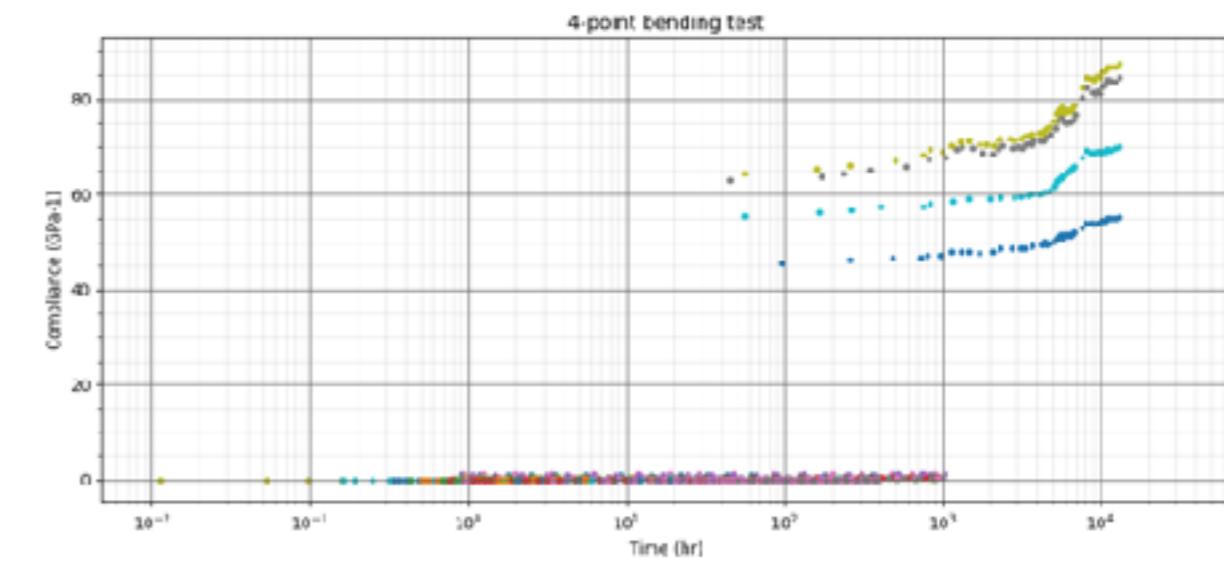
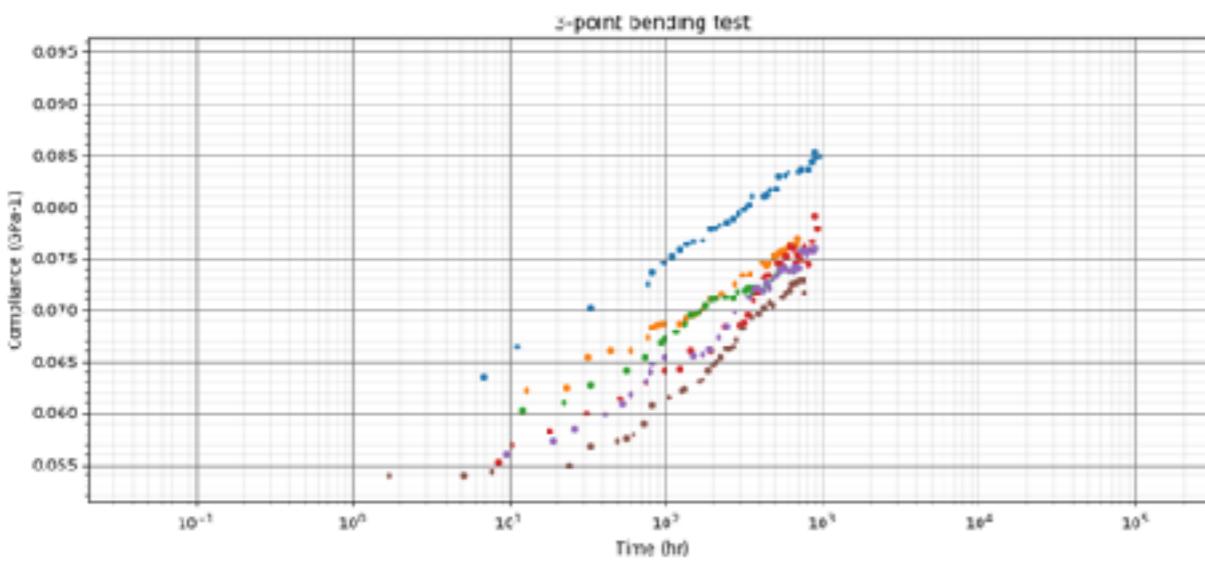
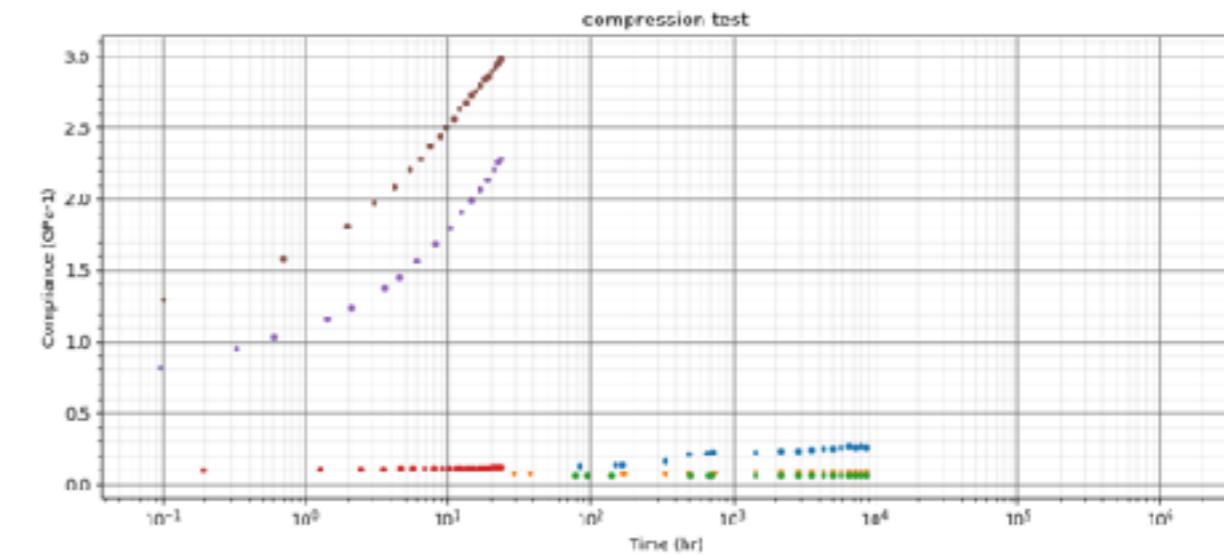
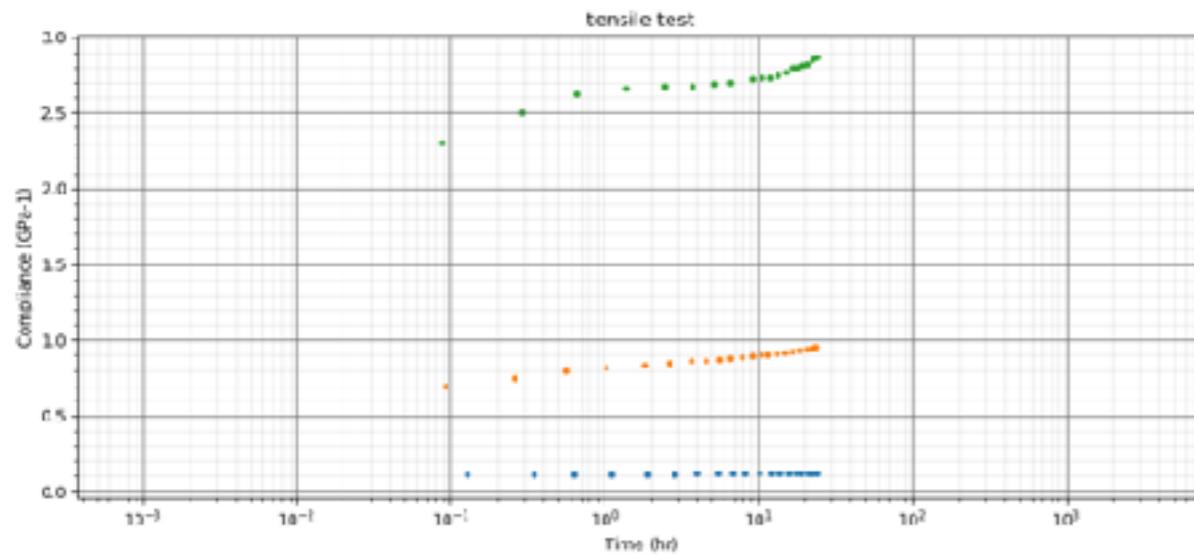
## example of a data set



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# An exemple of analysis :

on a selected range of temperature and RH according to sollicitation mode.



## Where are the data and/or tools ?

now ...



later ...



## Referencing ?



... ?

## Manipulation & visualisation ?



... ?

## Publication ?



... ?

# Conclusion

- if you have are or have been interested on wood rheology
- if you have some measurements to enhance the data collection
- if you have some ideas or needs around ...
- if you have some experience in data management

**Feel free to contact us.**

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9e Journées Scientifiques  
GDR Sciences du bois  
18-20/11/2020



# RheoWoodDatabase

***A unified collection of scientific data on wood rheology***

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