

# Status of Detector Characterization

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# Scope

- **Detector diagnostics**
- **Data quality**
- **Veto analysis**

## **Data Analysis**

**Veto info., target veto , Data quality, calibration accu.**

## **Detector Characterization**

**PEM, Aux. channels, Online-monitors, diagnostics**

## **Instruments**

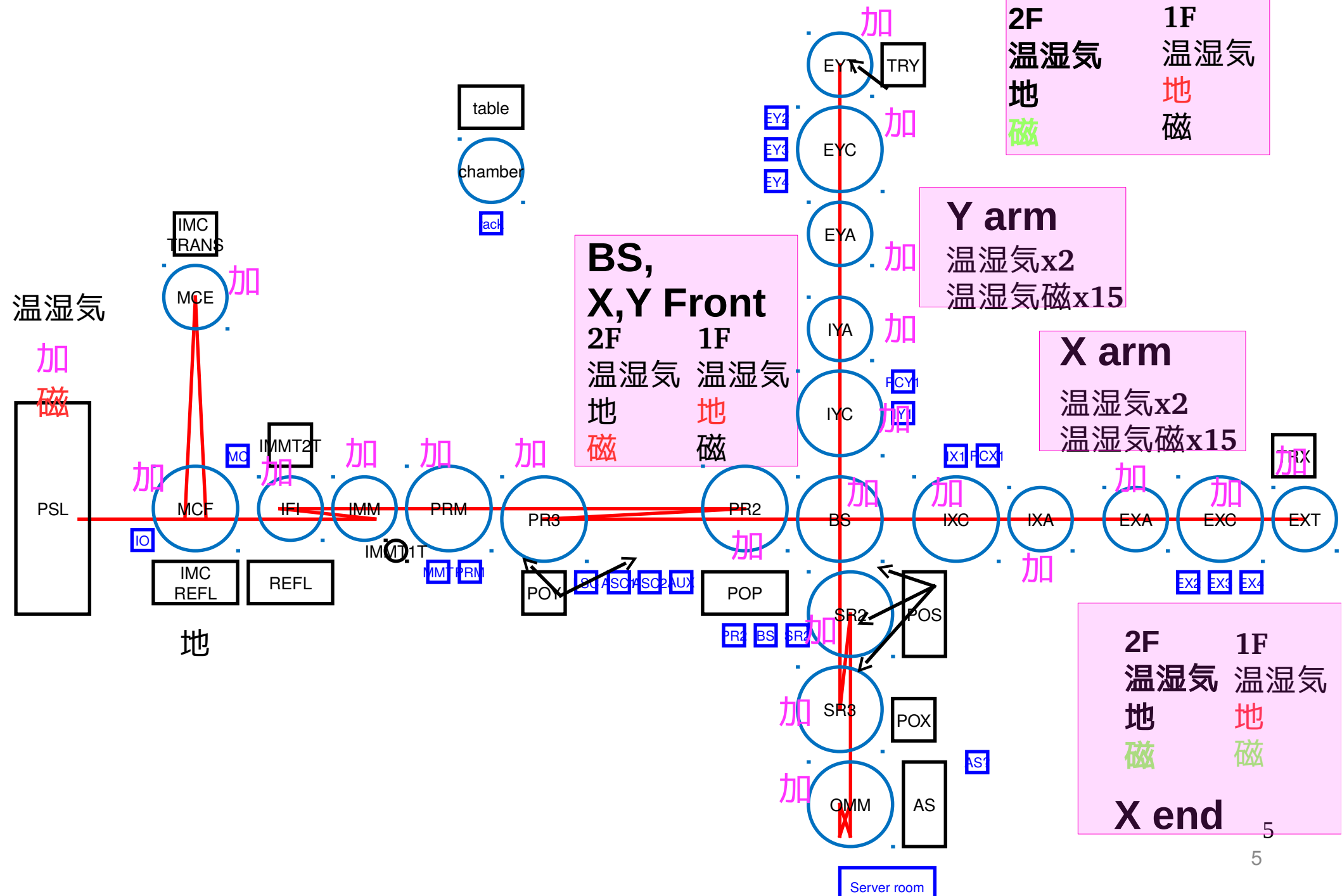
# Tasks

- **Support to understand what is happening in KAGRA**
  - DetChar tools
  - Environmental monitor sensors and PEM injection
  - Study of environmental issues
- **Data quality Information for operation, data analysis**
  - To define DQ using DetChar tools
    - Practice : iKAGRA data characterization
  - Selection of channels to use for DQ
  - Distribution of DQ flag to collaborators
- **Veto Information for data analysis**
  - Multi-channel analysis
  - Safe, unsafe channel analysis

# DetChar tools

- Main monitors has been implemented
- Dec 2016
  - Command line tools for quick analysis
  - Hands on session
  - Documentation
- Jan ~ April 2017
  - Web based tools will be updated
  - Daily summary page will be updated
  - Test run, then updating again.
- Integrating tools by KGWG detchar

# KAGRA Layout



**Y end**

2F	1F
温湿気	温湿気
地	地
磁	磁

**Y arm**

温湿気x2  
温湿気磁x15

**X arm**

温湿気x2  
温湿気磁x15

**BS, X,Y Front**

2F	1F
温湿気	温湿気
地	地
磁	磁

**X end**

2F	1F
温湿気	温湿気
地	地
磁	磁

# Environmental monitor sensors

## All below plan to run in June 2017

- Seismometer (3)
  - Running at Center, X end
  - Plan to run at Yend in 2017
- Magnetometer (2)
  - Next week, run at the Center (for CRY)
  - 1 is broken. Sent back to the company
- Baro, Hygro, Thermometer (9,13,13)
  - Running at X arm using GIF DAQ
  - Will make more amps to run all.
- Arm mapping (Baro, Hygro, Thermo, magnetometers, not for accurate measurement)
- Microphone :
  - now selecting. Candidate:
    - Bruel and Kjaer 4130 microphone
    - Bruel and Kjaer 2642 microphone preamplifie
- Accelerators
  - Plan to run in 2017

# Data quality information

- All tools for DQ plan to be implemented in Feb 2017.  
(~90 % are implemented)
- DQ categorization (~ March)
- iKAGRA data characterization
  - ~March 2017, analysis
  - April~, report
- Glitch classification (~ middle 2017)
- Safe channel, correlation will be explained by John Oh.

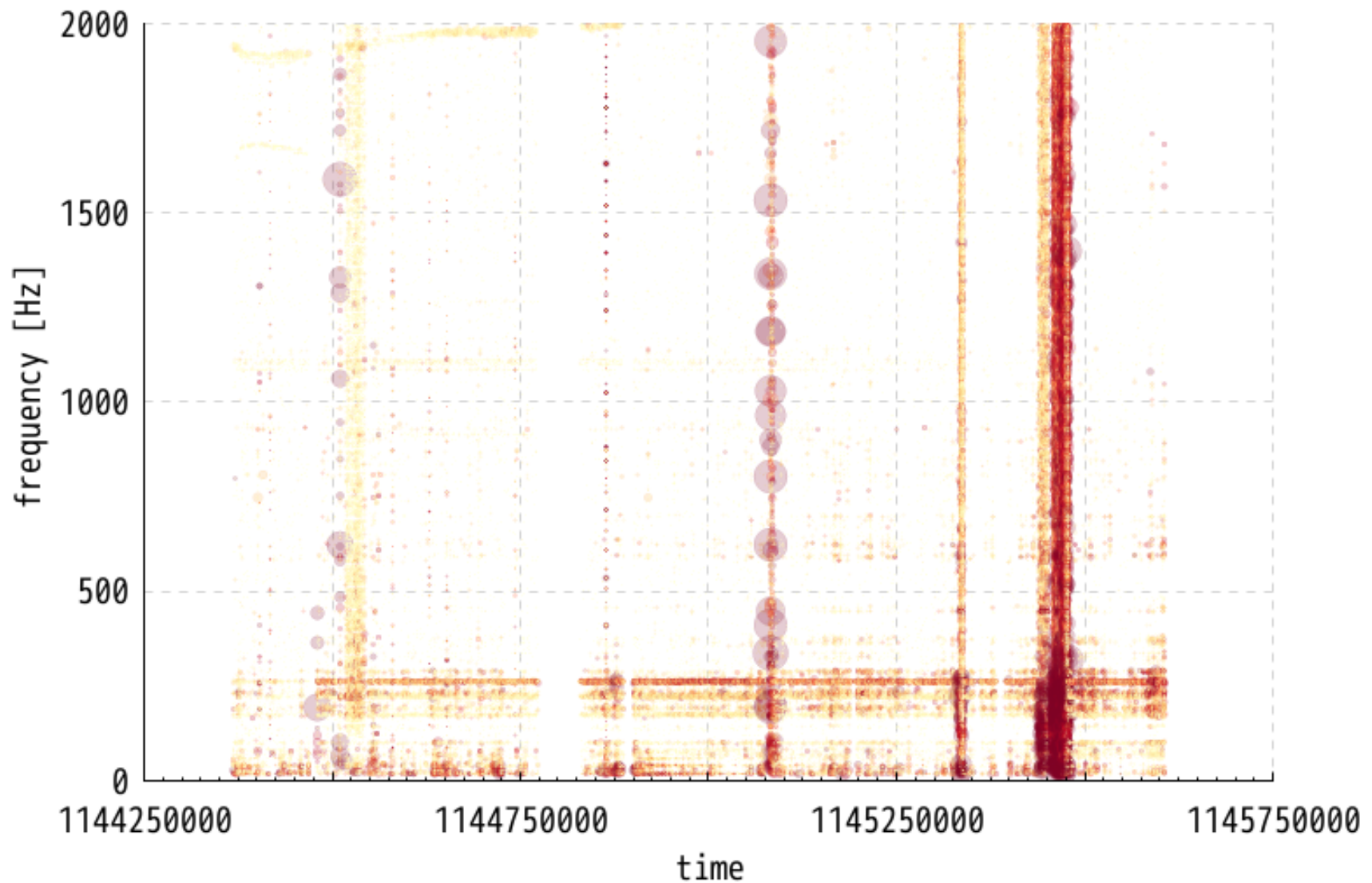
# Veto study

- Multiple-channel analysis using iDQ(LSC tools), especially ANN
- New development
  - ChirpletMon
  - ...



# Glitches during iKAGRA test run

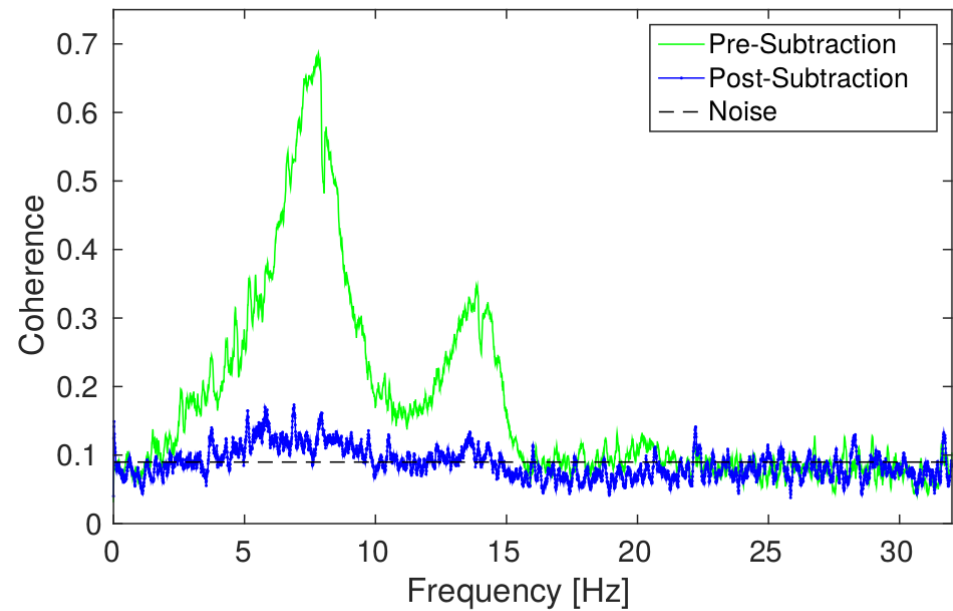
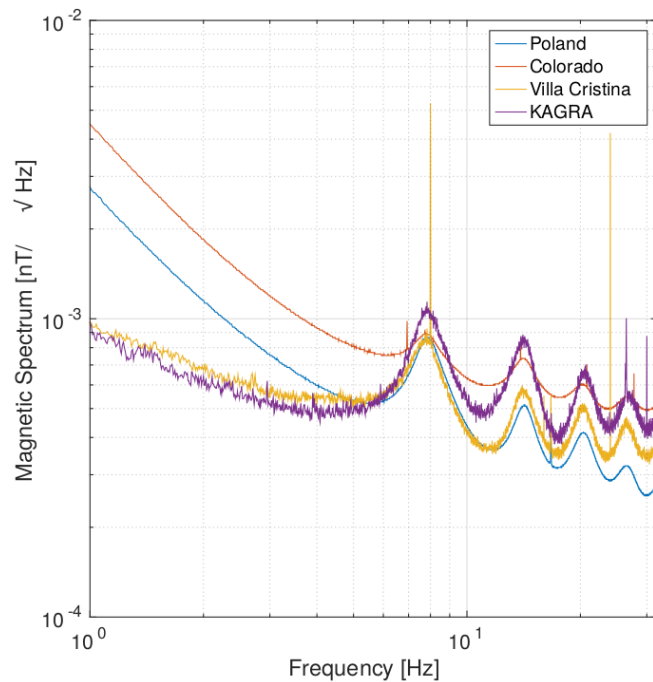
triggered during iKAGRA



events

# Schumann resonance

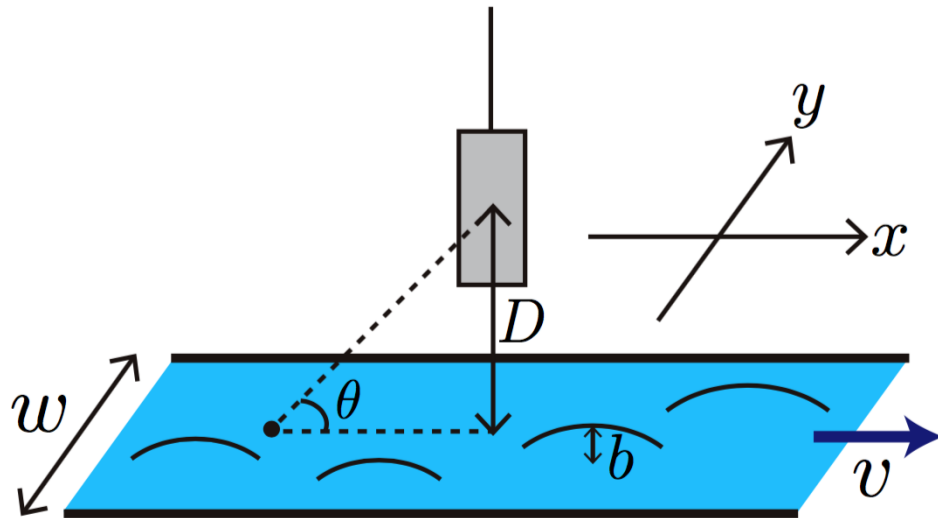
- Collaboration with Virgo, LIGO
- Coincident measurement in July, 2016]
- Saw high coherence
- Succeeded to subtract it



(e) Amplitude Subtraction

# Water Newtonian Noise Estimation

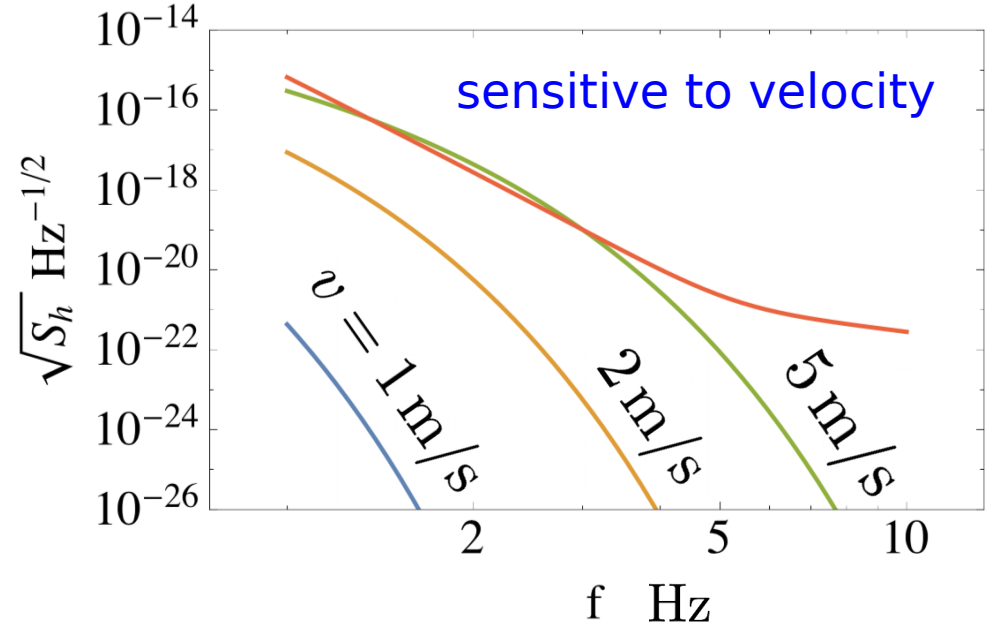
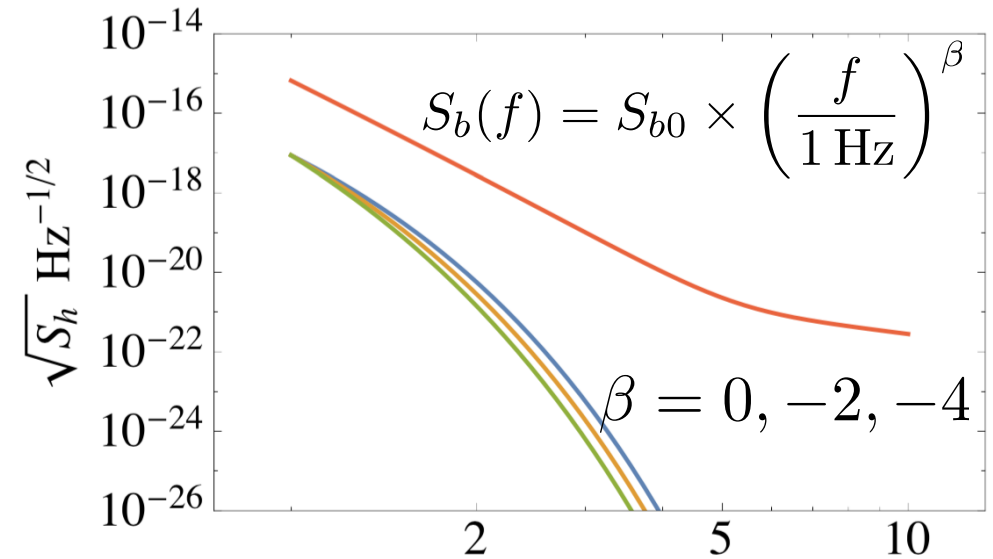
water flow along an open channel



(assuming a smooth surface for a water pipe and negligible transverse velocity)

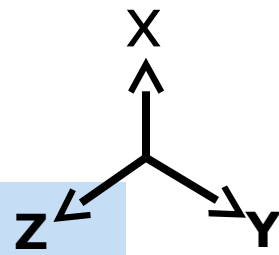
How do we check this?

Nishizawa

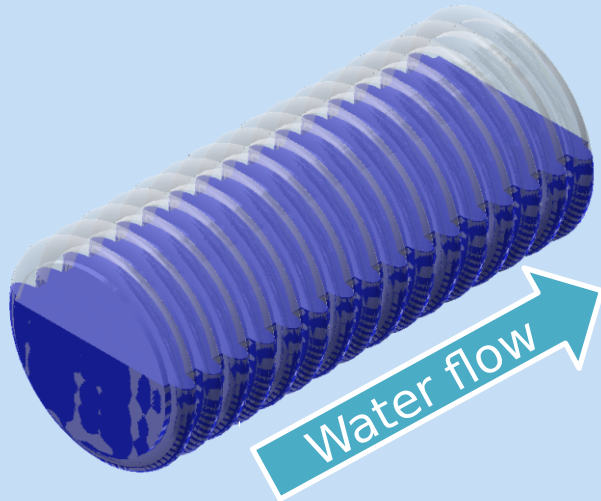


# CDF

## Model



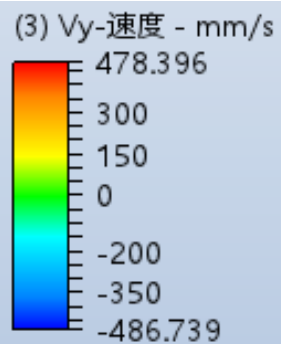
$\Phi 443$  mm  
L=1024 mm  
Groove width: 20 mm  
Groove height: 38 mm



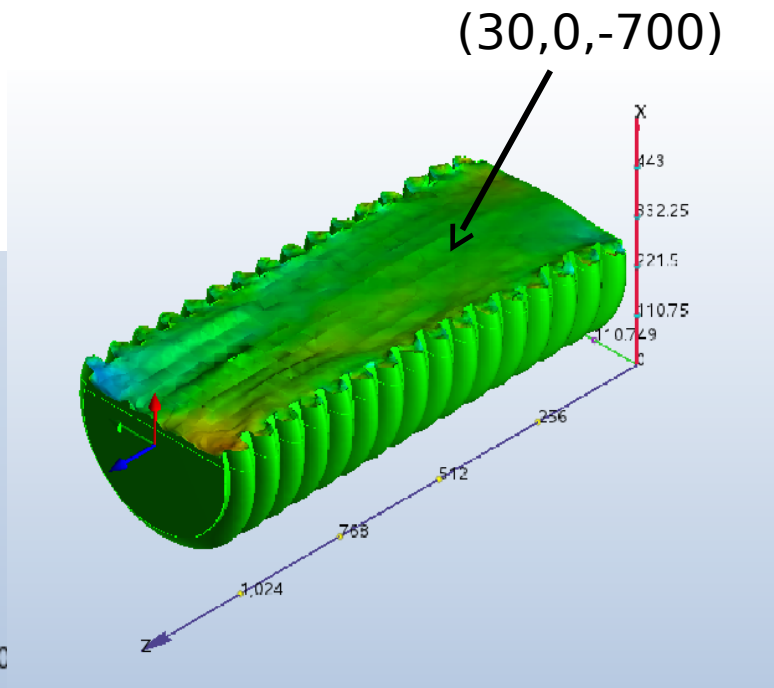
## Conditions

Material: Water  
Initial Velocity: 1000 mm/s  
Initial water surface height: 220+38 mm  
Boundary flow velocity: 1000 mm/s  
Analysis time: 10 sec

## Result



Frame: 100



Time vs Vy Flow Velocity at(30,0,-700)

