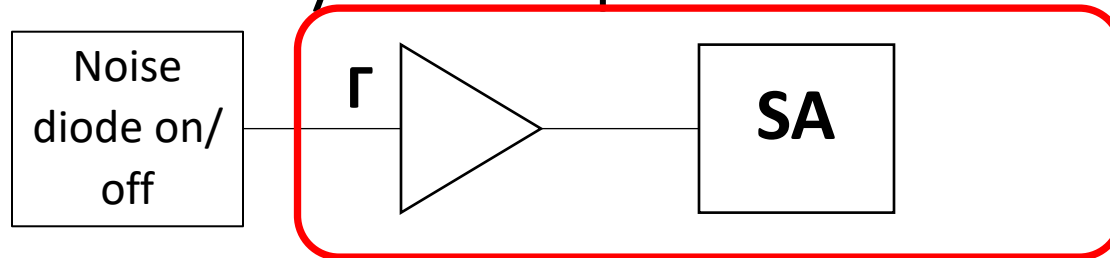# Organization of tasks, proposal:

- Power calibration – LNA noise

- Booster determination

- Data monitoring

- Peak search
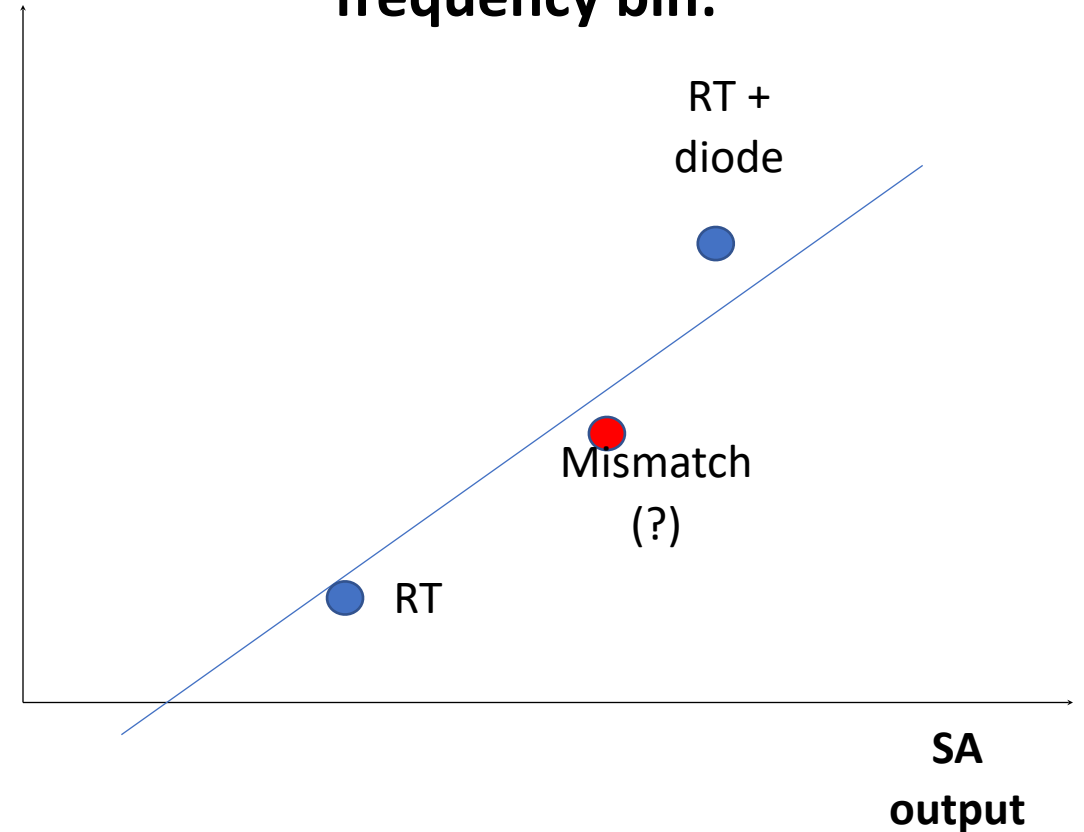
Power calibration:

- Y-factor

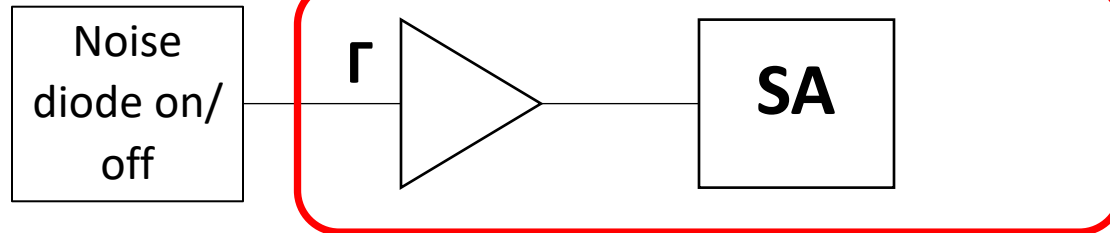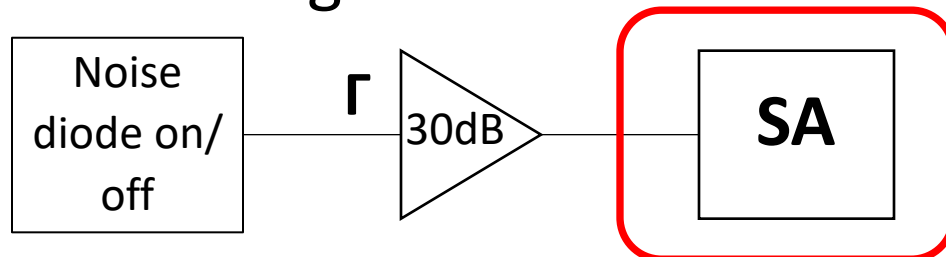 → See Bernardos slides

- LNA-SA system response:

Power calibration:

- Y-factor
  - → See Bernardos slides

- LNA-SA system response:

- Use LNA gain + known diode excess noise

Input power /Gain

RT + diode

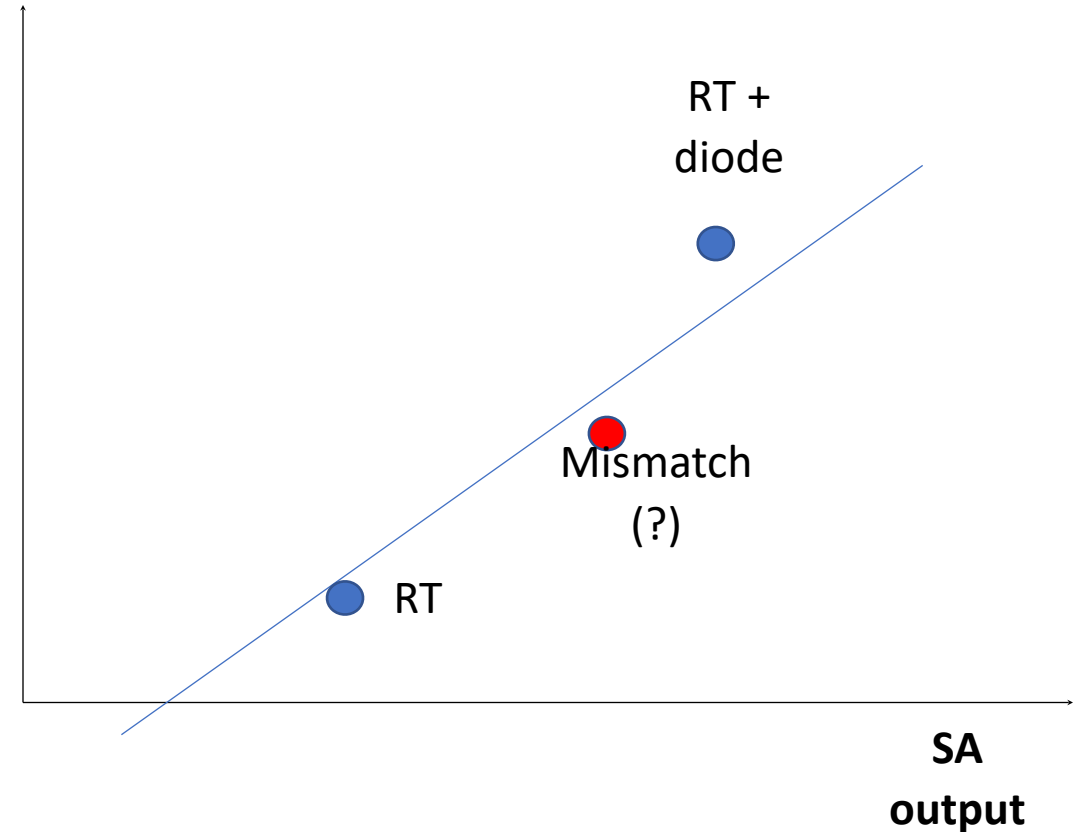Mismatch (?)

RT

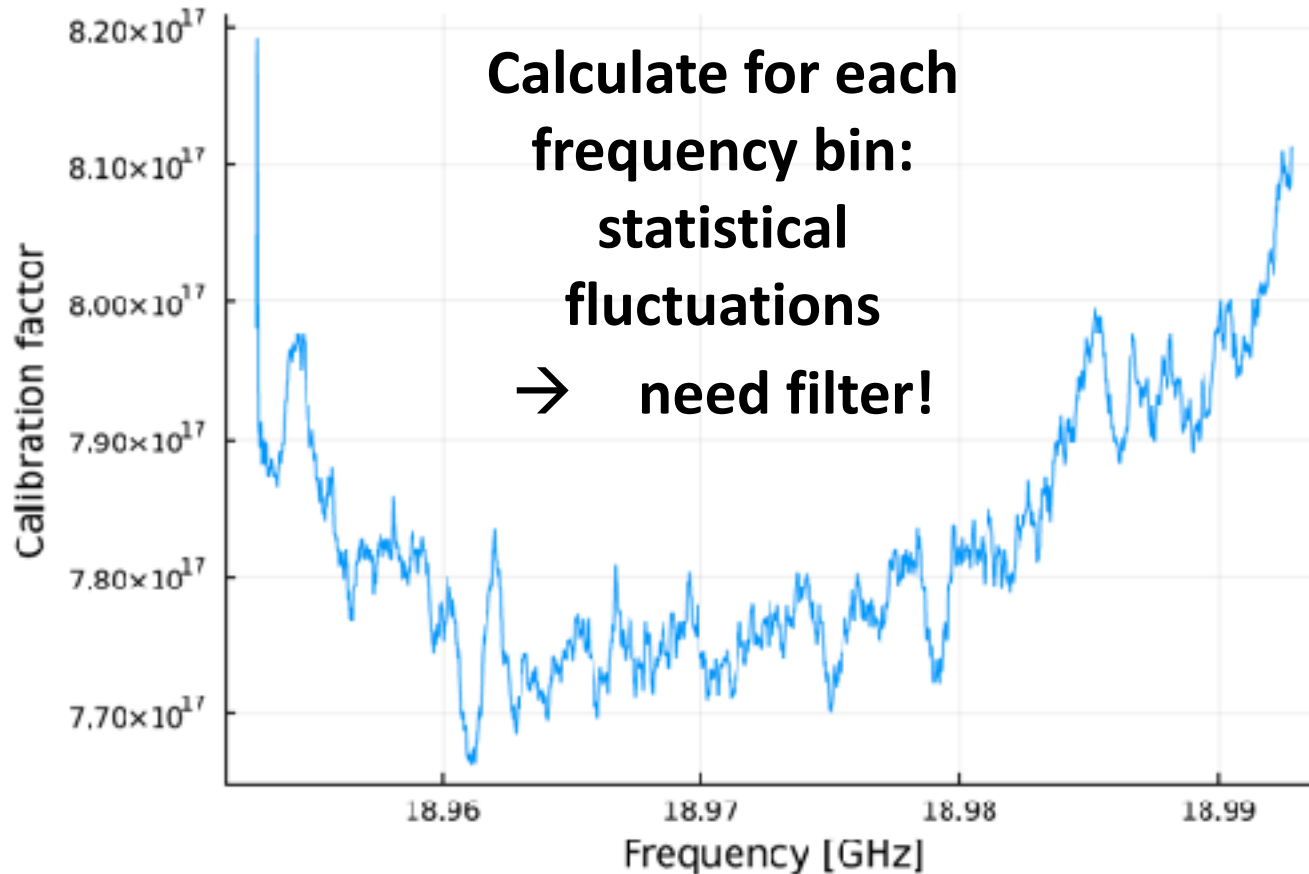**SA output**

Beware: need proper treatment of reflectivity at LNA input !

Gain measurement / data sheet?

Power calibration:

Input power /Gain

Calculate for each frequency bin: statistical fluctuations
→   need filter!

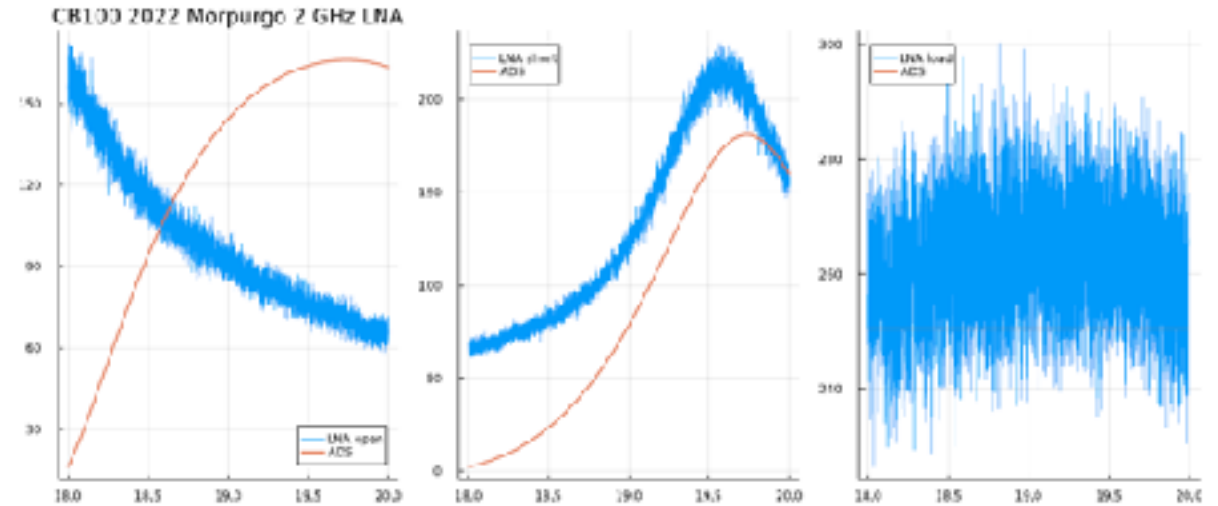**Apply filter to data or to result?**
What filter(s)? Width? Spline?
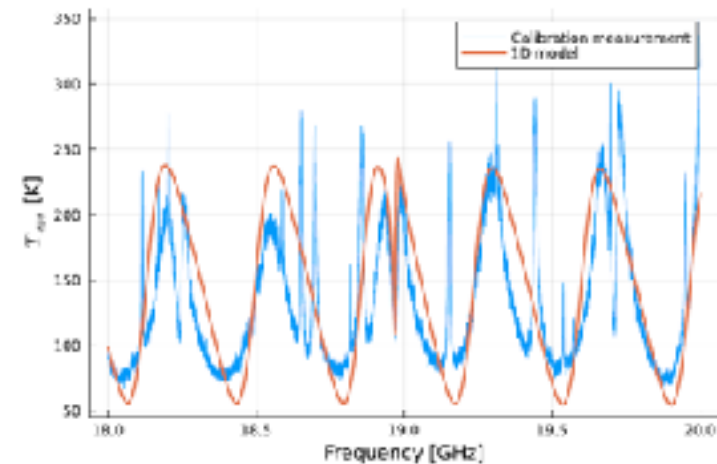**→   Needs investigation**
→ Contributes to systematic uncertainty

Boost factor determination:
(see tratment by David)

- LNA model

- Booster model

- System model

- COMSOL (?)
  → effect of B-field at taper?

Noise standards 2022

System noise 2022

Boost factor determination:

(see tratment by David)

Needs power calibration as input!

- LNA model

- Booster model

- System model

- COMSOL (?)

  → effect of B-field at taper?

Noise standards 2022

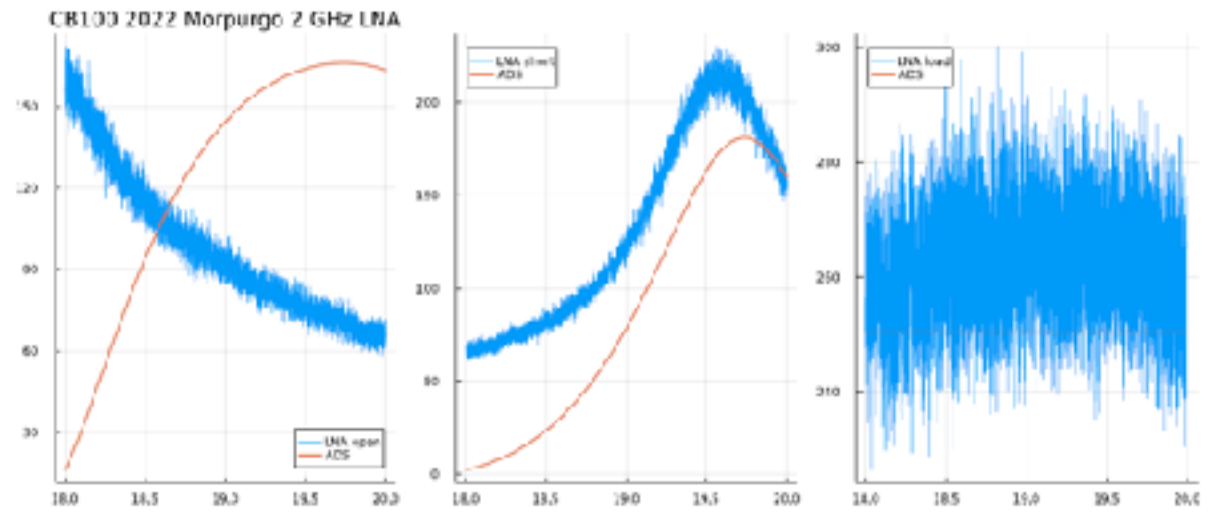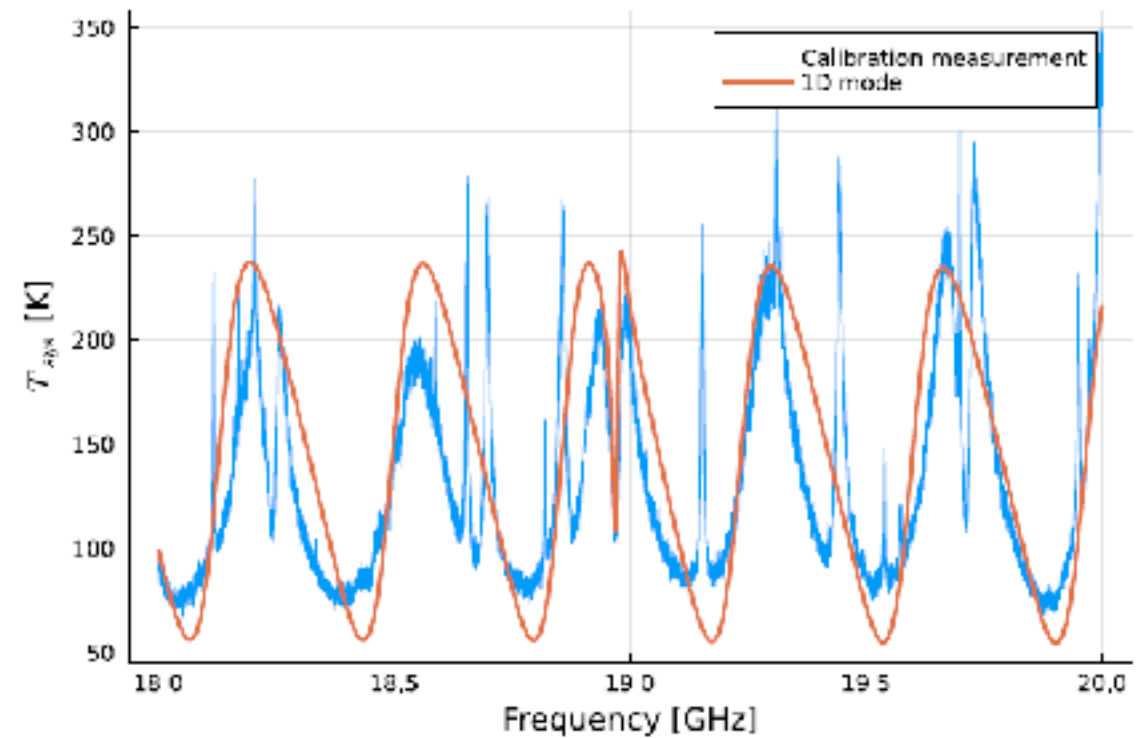Uncetrainty by fitting only either Open, Short or Load
→ How about mismatch?
Uncorrelated I and V noise?

- Extract boost factor for four (incl. mismatch() configurations

- Add non correlated noise component

Boost factor determination:

(see tratment by David)

What abour COMSOL results?

- LNA model

- Booster model

- System model

- COMSOL (?)
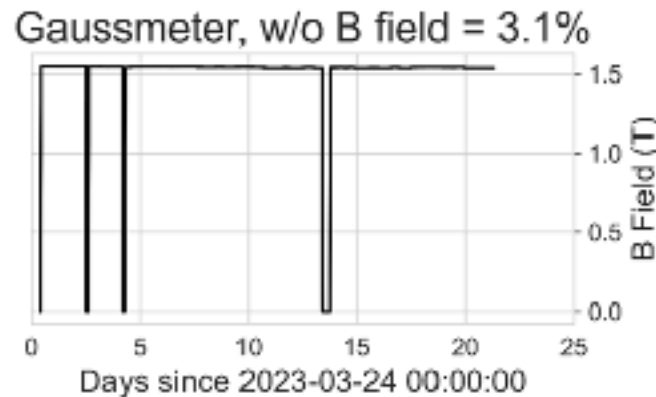 → effect of B-field at taper?

System noise 2022

How to fit this?
Include longitudinal modes
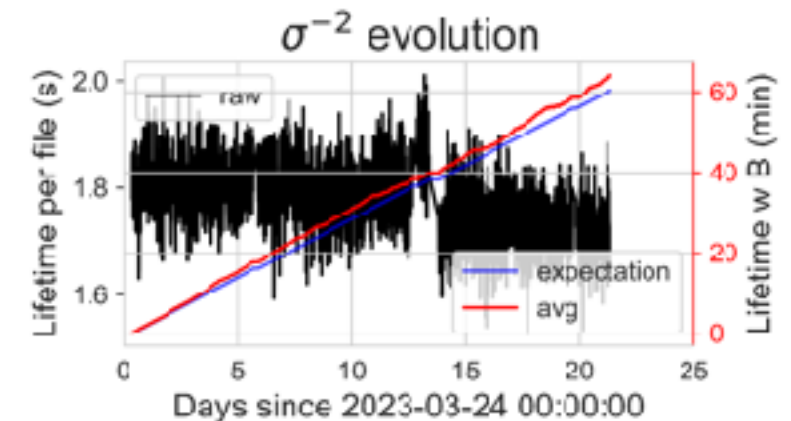Position and depth/height of Maxima and Minima?
What about emissivity?

Data monitoring: + Quality control

- B-field

Gaussmeter, w/o B field = 3.1%

Need to reproduce for 2022 MORPURGO and Bonn data

- Temperature

  Correlations with gain/baseline?

T per 1 kHz, 14/04/2023,08:31 UTC

- Baseline fluctuations :

  T_{sys} is ~ constant (T fluctuations?)

  → Correct T_{sys} if fluctuations > ΔRT

- Gaussianity

  → Do we have files that should not be included?

  → Exposure: get from RMS:

σ^{-2} evolution

Peak search:

Needed as input: normalized full exposure noise power spectrum.
Uncertainty until here: power calibration & boost factor

- Bayesian? Frequentist? Both!

- Limit setting / Discovery sensitivity?

- ADMX styly – Haytstac style? Our own?

- Limit setting: what C.I. / C.L. →   SNR?

- …

Organization of tasks, proposal:

Lead: N.N. to be discussed by the team

- Analysis team coordinator   Alberto
- Power calibration – LNA noise   Bernardo + David, Anton
- Booster determination   David + Anton, Bernardo
- Data monitoring   Dagmar, Vijay, Juan
- Peak search   Johannes, Vijay

→ Regular 1 day meetings every 2/3 weeks, preferably in person
→ Use Aachen collaboration meeting for extended review by collaboration