Simulation requirements for GEO commissioning

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Simulations for GEO600

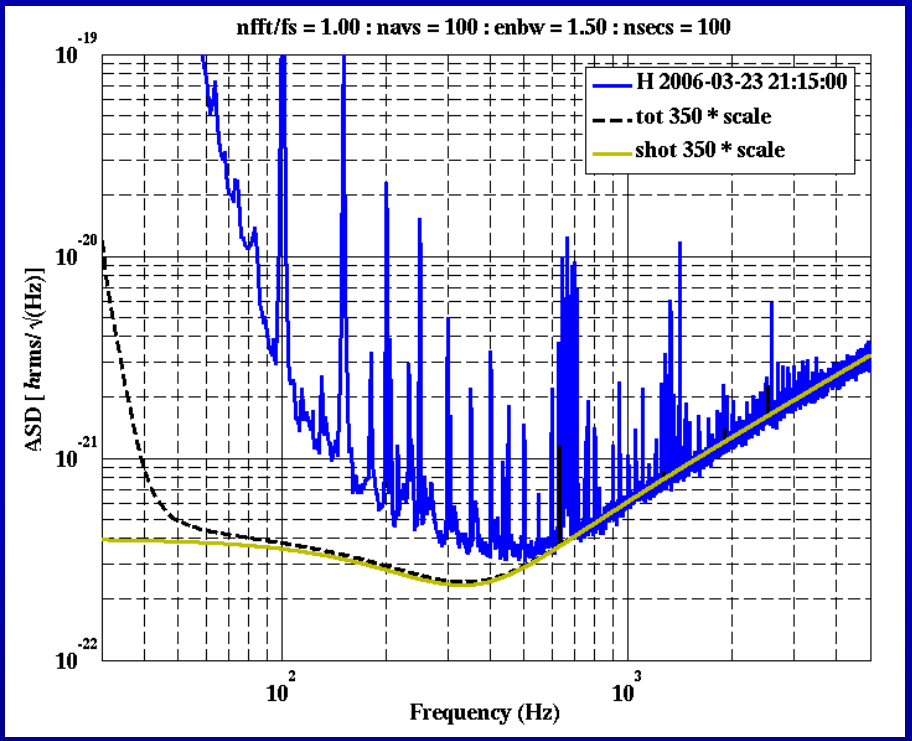
Question:

If there were a supermarket for simulations what would we like to buy?

Shot noise of GEO

Goal:

To gain more confidence about the prediction of the shot noise level

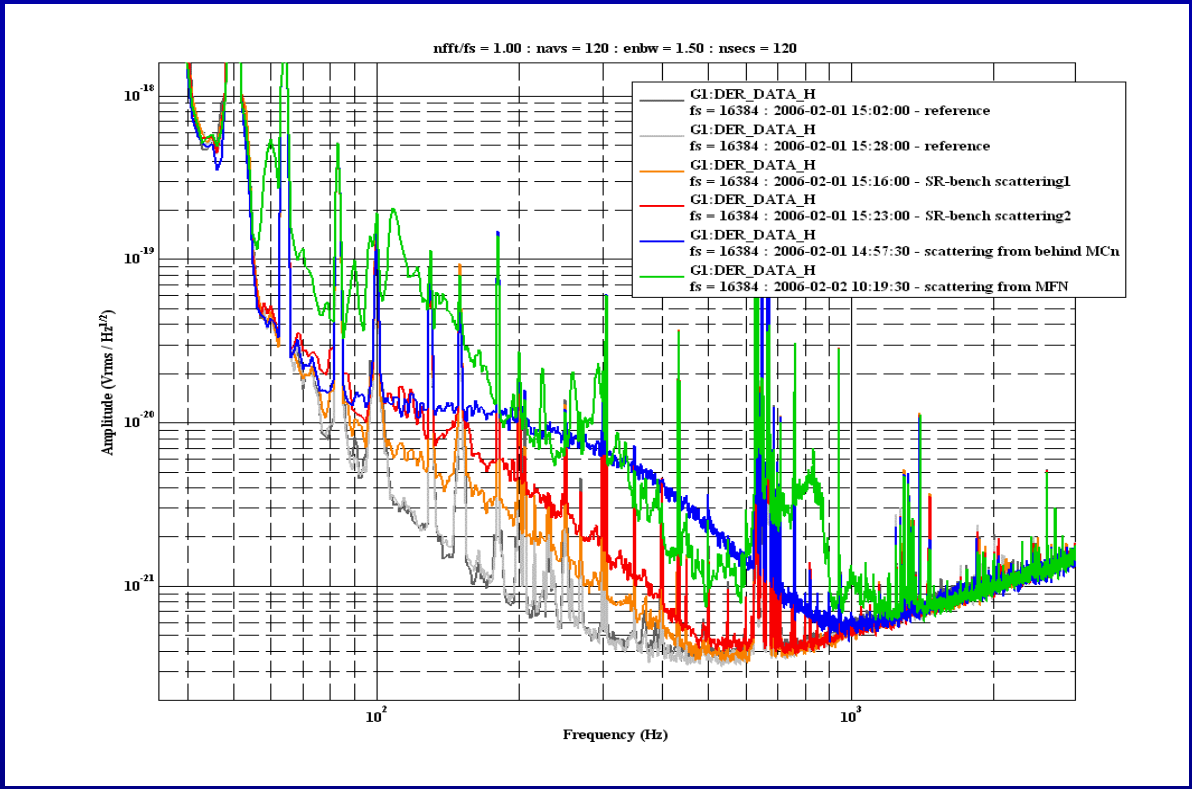


- additional noise from heterodyne detection (exact factor??)
- other effects that may have an influence

Scattered light problems

Goal:

To gain understanding of the scattering effects we observe.

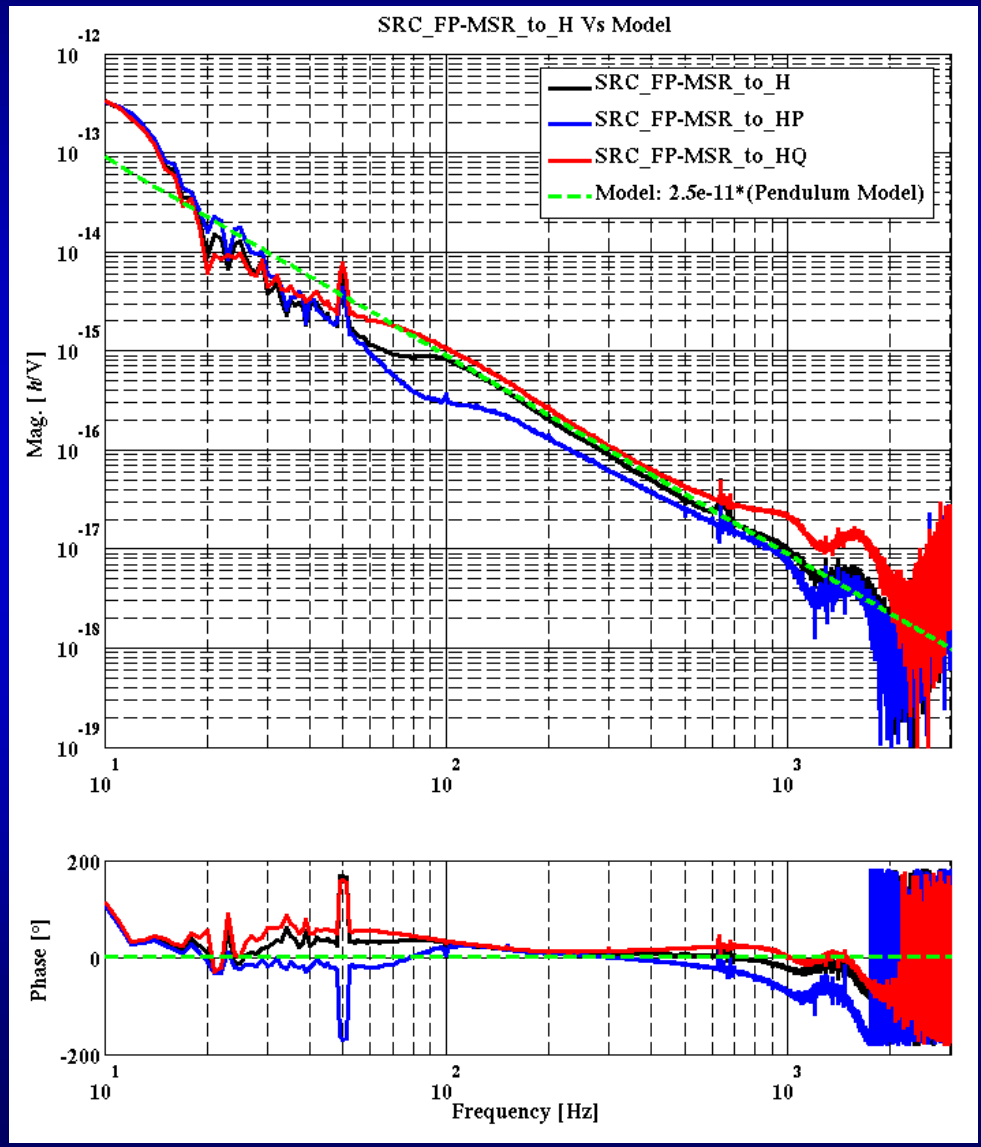


- What is the driving motion of the scattering ??
- Coupling paths ??

Modelling of TFs to h(t)

Goal:
Understand details of the measured transfer functions

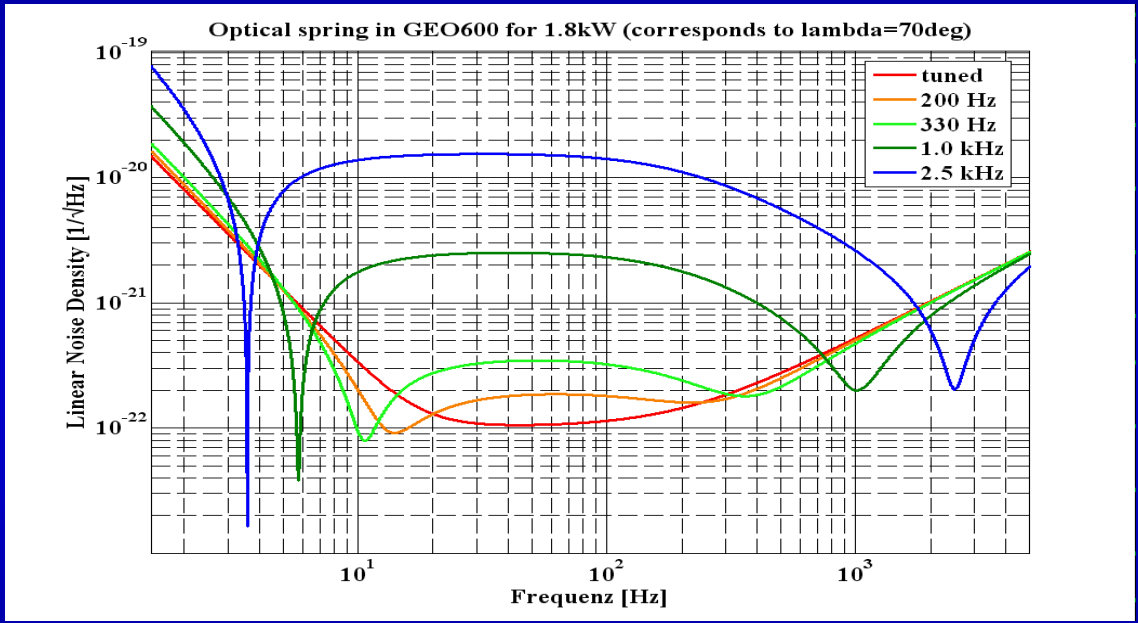
- Better understanding of the detector
- Helps commissioning



Optical spring

Goal:

Understand why we are not able to measure it.

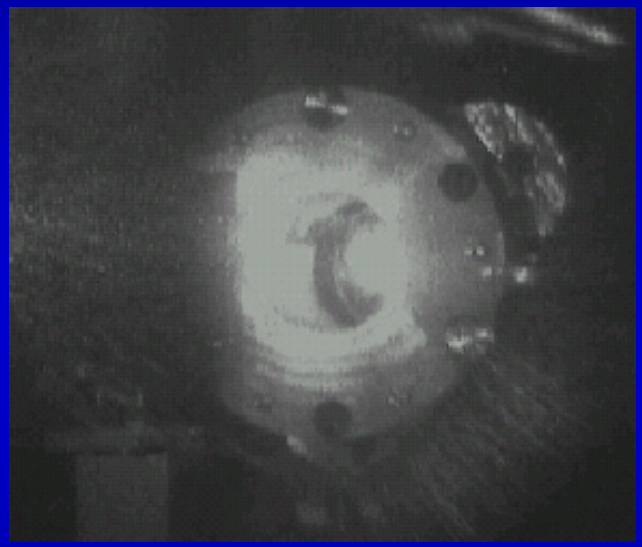


- Perhaps losses in the IFO are too large ??
- Seeking a tool capable of handling a real (non ideal) system
- Implementation into FINESSE ?

Mode shape versus beam clipping

Goal:

Understand wheter we have a serious beam clipping problem



- We observe less power buildup than expected
- The darkport mode looks slightly distorted (higher order modes?)
- What does the mode look like in the presence of clipping inside the detector (beam dumps, MPRrm)?

Lock acquisition with full power

Goal:
Get a strategy for lock acquisition with full power buildup.

- We don‘t have the full power build-up in IFO so far.
- Hopefully we are able to establish full power build-up soon.
- Open question: Is lock acquisition possible?
- Probably time domain simulations can provide help.