

Station report: SG CD-034 at
Moxa observatory



Observatory changes and activities in the last years

- Two new boreholes in front of the observatory since 2013; they can be used for hydrological experiments (reported in Triest)
- new station engeneer: MSc Niklas Wennemuth; Wernfrid Kühnel is retired (March 2017)



New engeneer
Niklas Wennemuth
studied

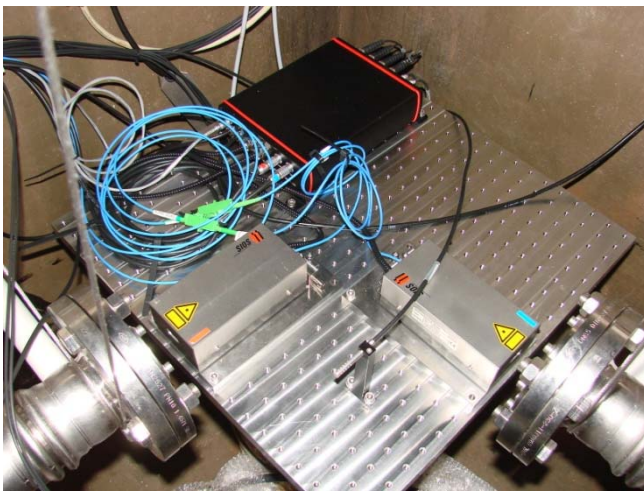
Technician
Matthias Meininger

„scientific instrumentation“

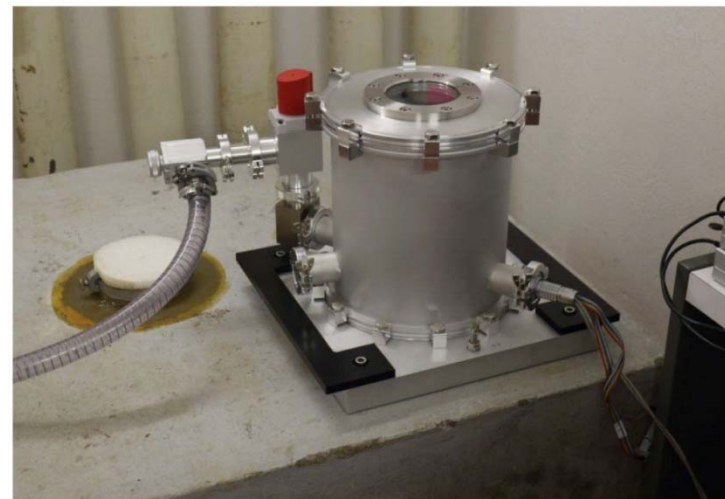
Staff of the observatory since 2017, March

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laser strainmeters at the gallery knee



new balance tiltmeter (TU Ilmenau),
test recording since 2016, Dec.

First Tests with the compensation balance tiltmeter, TU Ilmenau

principle (Kühnel et al., 2014):

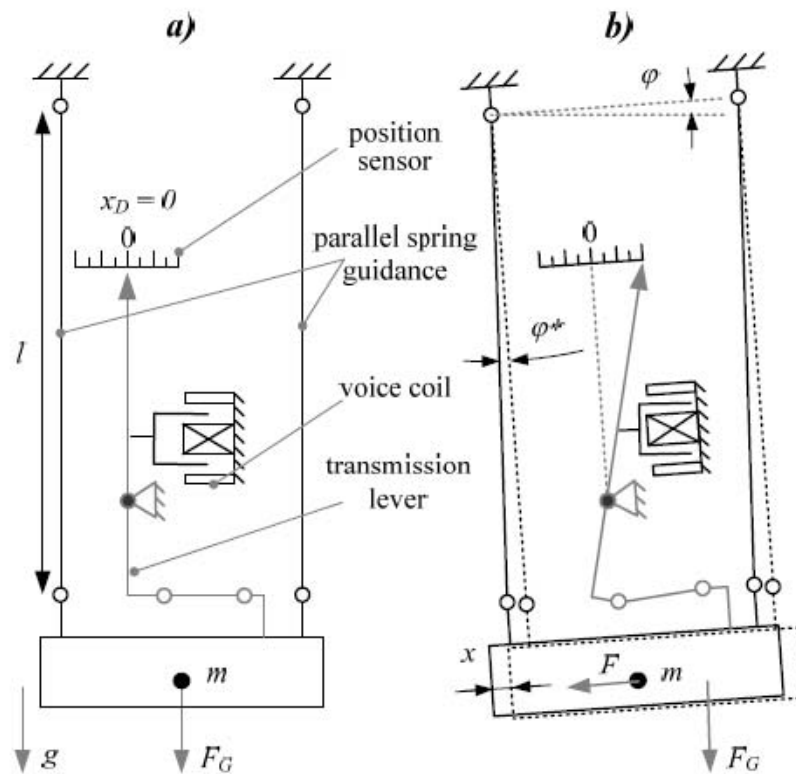


Figure 1: a) hanging weigh cell b) weigh cell tilted by φ ; in this case the coil is not generating a compensation force

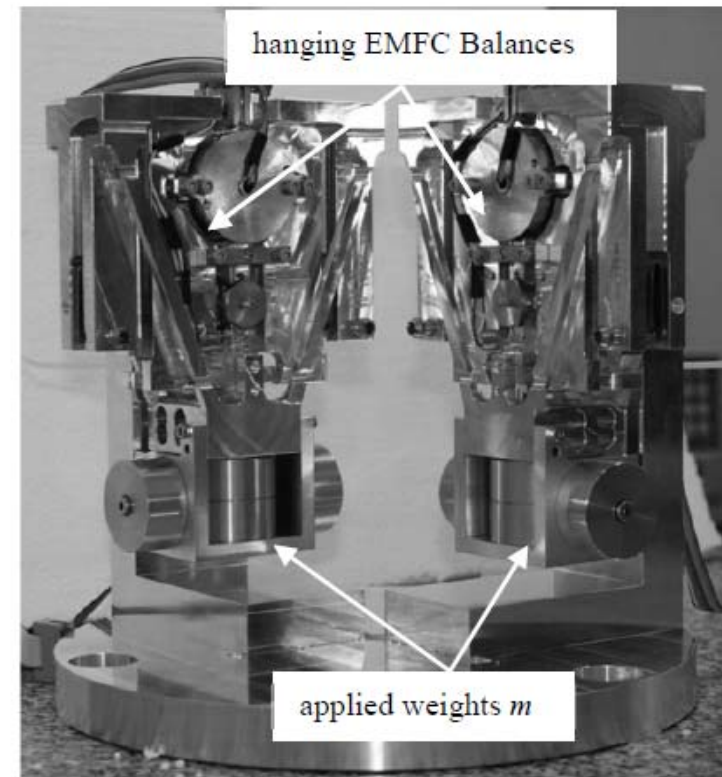
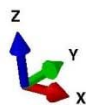
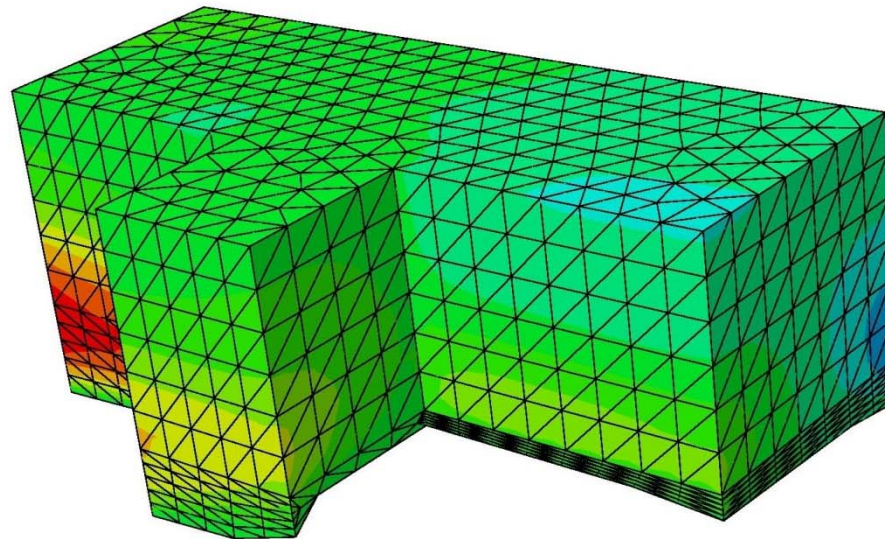
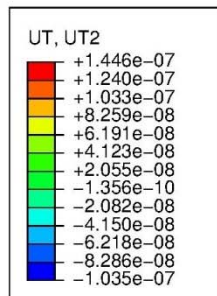


Figure 2: dual axial Tiltmeter realized by mounting two EMFC balances in a hanging position

Finite-Element-Modelling (ABAQUS) for tilt estimation of the SG pillar:

- typical properties of concrete
- pillar temperature 300K, (27°C)
- water level up to 60cm under pillar surface
- > max. water pressure of about 12kPa with a gradient to zero upward

Calculated tilt effects are compared with the results of the tiltmeter on the pillar



ODB: Job-1.odb Abaqus/Standard 6.14-2 Wed Jun 07 14:35:35 GMT+02:00 2017

Step: Step-1
Increment 1: Step Time = 6.0000E+05
Primary Var: UT, UT2
Deformed Var: UT Deformation Scale Factor: +1.000e+00

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- New cover canvas on the roof above the SG location in 2016
- Protection radius against wind power mills is confirmed to 10km around the observatory (2016) by the district office of east Thuringia; the negotiations were supported by the legal department of the university Jena (...but this problem is certainly not solved for ever...)



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-
- Prologongation of the contract about the GPS permanent station of the BKG until 2022
 - New geoelectric measurement on the hill above the SG for improving the hydrological model for the SG data correction (current work of a master thesis)

Status of the superconducting gravimeter CD-034 at Moxa observatory

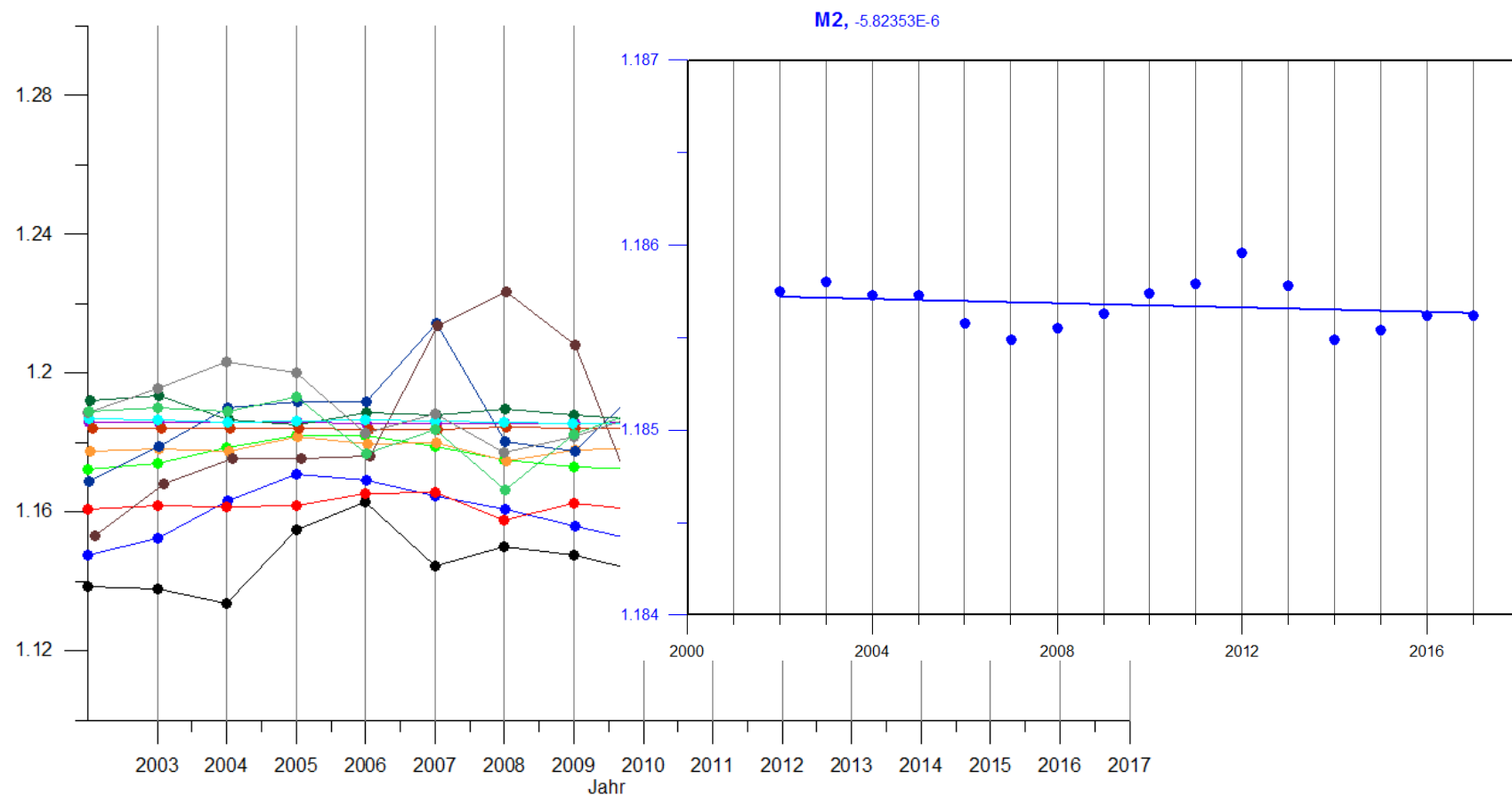


Status of the SG CD-034 in Moxa

- Instrument is running fine after some problems in 2013 (we reported in Warsaw)
- Liquid helium direct from the University Jena (cryogenic temp. physics) is available after some problems with the delivery in 2015. We have to refill the dewar (125 liter) after approx. 16-18 months
- All additional data (tilt, neck-temps, ...) are again available after a short interruption
- Problems with the compressor in 2017 (failure in the electronic); no stable situation: helium consumption increased by a factor of seven. University Jena solved this problem by funding a new one (in a short time)

Current investigation with Moxa SG data

- Long-term tidal parameter investigation



Thanks for your attention!

(www.geophysik.uni-jena.de → Observatorium Moxa)