

LMU - Cluster Universe
Stefan Rummel

PS meeting - Sept. 2nd





- Ivan on DCD/DHP regulation requirements
- News from Santjago
- LMU – news, regulation in presence of delays

- Discussion:
 - Source on GND / grounding
 - Parameter definition and ranges
 - Open issue - Over voltage protection

- Service:
 - TDR cable samples shipped to Japan
 - In contact with Samtec for application specific connector for Gbit links on a width*profile of 20*5.7mm
- Just received some infos regarding: B-field and radiation hardness outside the detector
 - Order of magnitude $\sim 10\text{G}$ ($\sim \text{mT}$) – outside the flux return yoke
 - Outer layer of KLM sees a rate of 0.48 Hz/cm^2 → back on the envelope calculation gives - .1kRad/10a with factor 100 safety
- Dipl. Ing. Andreas Seiler joined our group on August 15th
- Started to investigate regulation over long distance
 - Design of a regulator and a test-load with fast transients
 - Analysis of regulation with delays with Matlab



•Goals:

- Understand impact of long lines
- Get idea of limits ↔ requirements of ASIC's
- Get idea on required capacitors – capacity, ESR – important feedback to EOM- and/or PP- design

- Simulation of regulator response with delays
- Delay at least L/c $c \sim 0.6c_0 \rightarrow 55\text{ns}$ for 10m cable
- Investigated model:

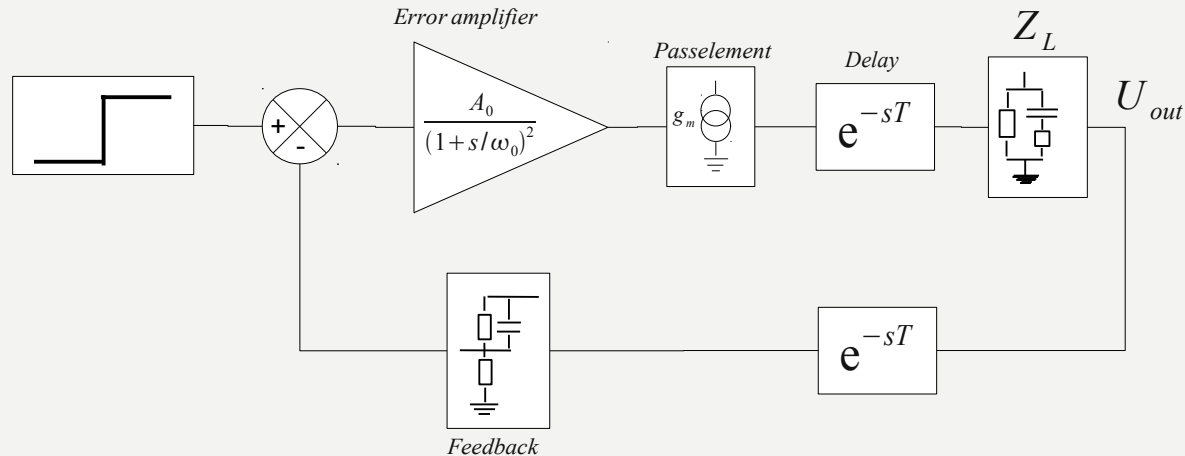
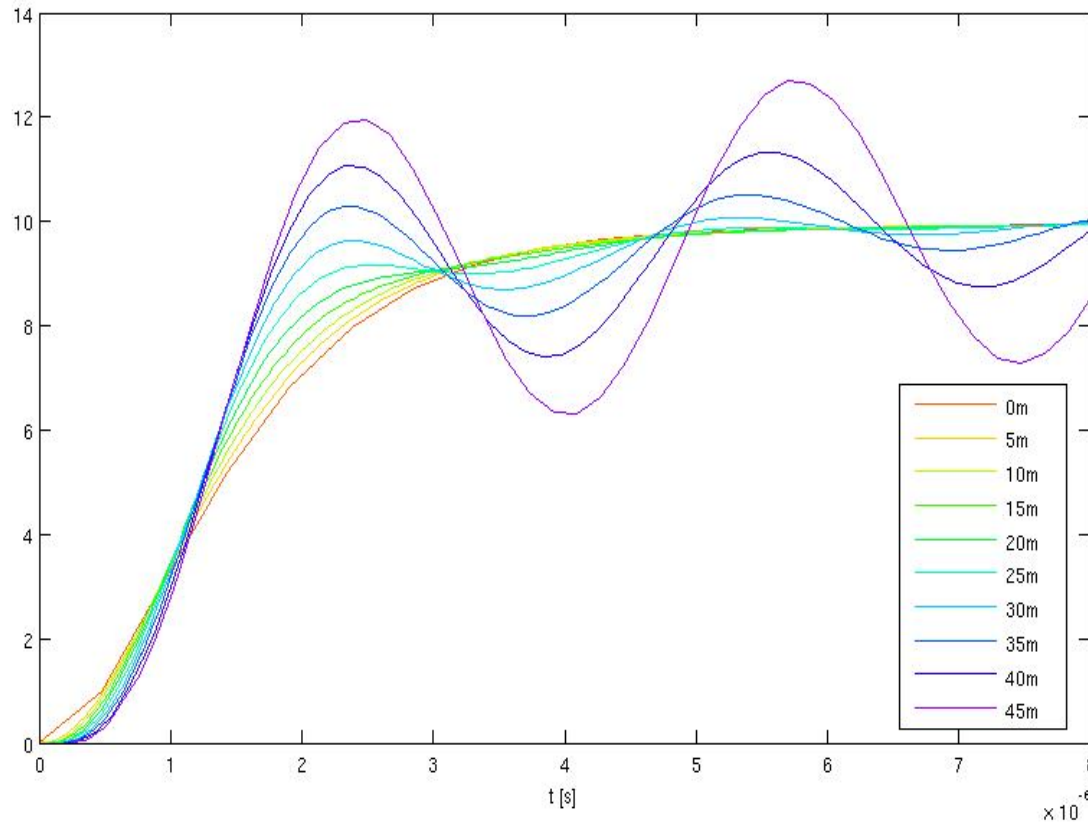


Figure of merit:

- Step response
- Settling time, over shoot, rise time...
- Phase margin



Setup

Erroramp.:

A0 4k

w0 50kHz

Passelement:

Gm: 2S

Feedback:

R1/R2: 1/10

Cfb: 150pF

Load:

Clod: 10 μ F

ESR: 0.1 Ω

Rload: 1 Ω

C/C0 0.6

Next steps:

- Incorporate realistic parasitics Rline, Lline, Cpass..
- Investigate stability in Cload, ESR, speed parameter space
- Test with realistic cable (length, diameter)