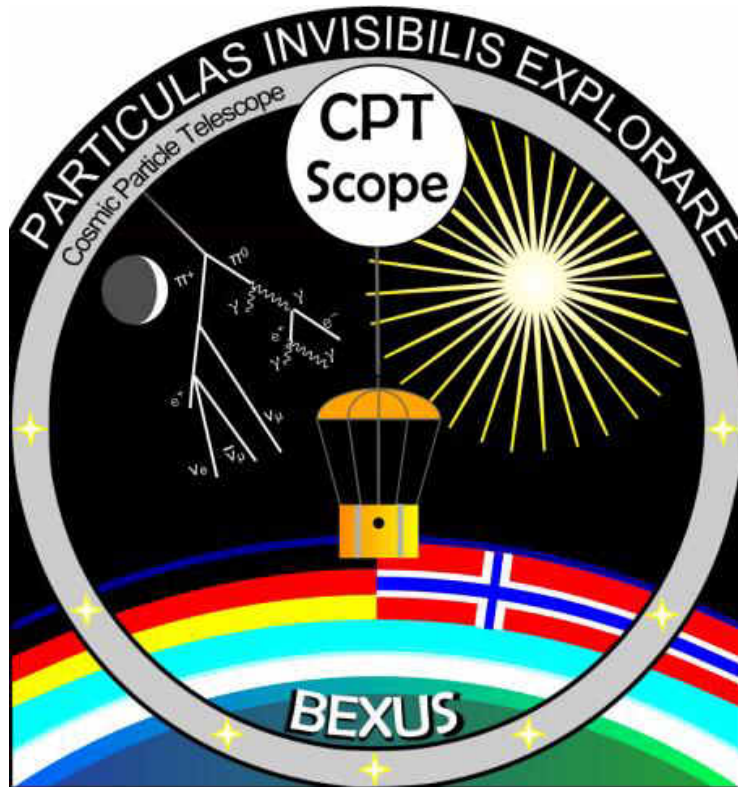


The Cosmic Particle Telescope – First Results



1st Symposium on Space Educational Activities
Padova, Italy | Dec. 9-11, 2015

Presented on behalf of the CPT-SCOPE team by
Anastasiya Dykyy, NTNU Trondheim, Norway
and Timo A. Stein, IDEAS, Norway
timo.stein@ideas.no

What is CPT-SCOPE?

CPT-SCOPE (Cosmic Particle Telescope):

joint Norwegian-German student project
to build a low-cost, compact radiation monitor
for European nano- and pico satellites
... for now a technology demonstrator to fly aboard a stratospheric balloon.

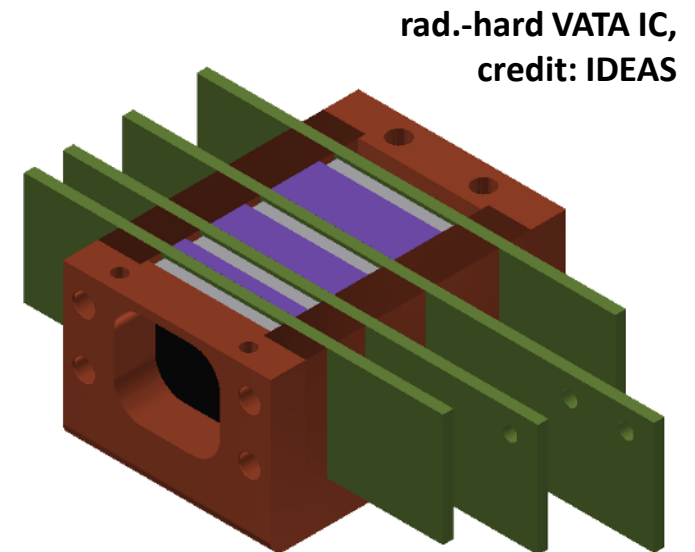
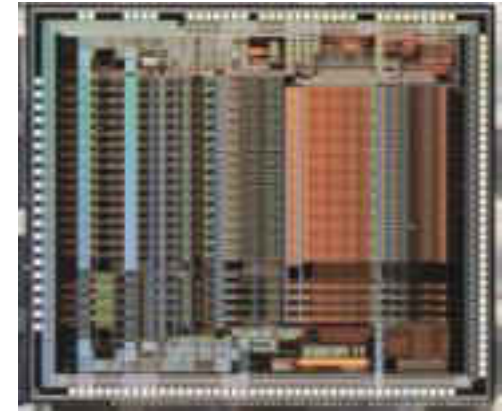
Strategy:

- use off-the-shelf components (system)
- use rad.-hard integrated circuit technology (detector front-end)
- use particle telescope geometry
- use industrial Si-detectors

Partners:

- IDEAS, Oslo, Norway
- NTNU, Trondheim, Norway
- {FU, TU, BEUTH}, Berlin, Germany

<http://www.cpt-scope.com>



rad.-hard VATA IC,
credit: IDEAS

particle telescope sketch



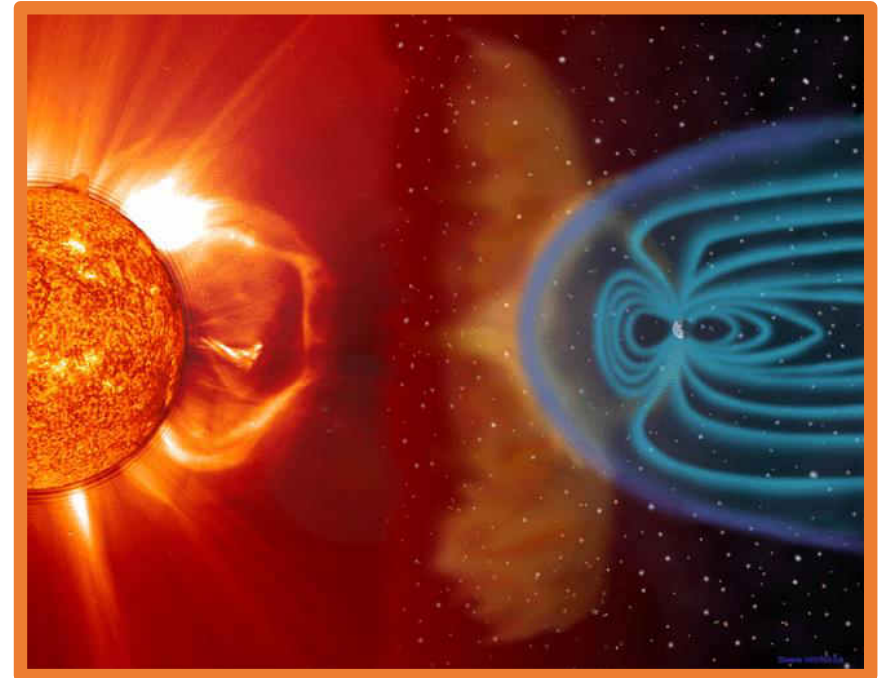
Objectives

Technology (primary):

- compact **radiation monitor** for (near) space applications
- **readiness of ASIC**
- **particle telescope geometry**

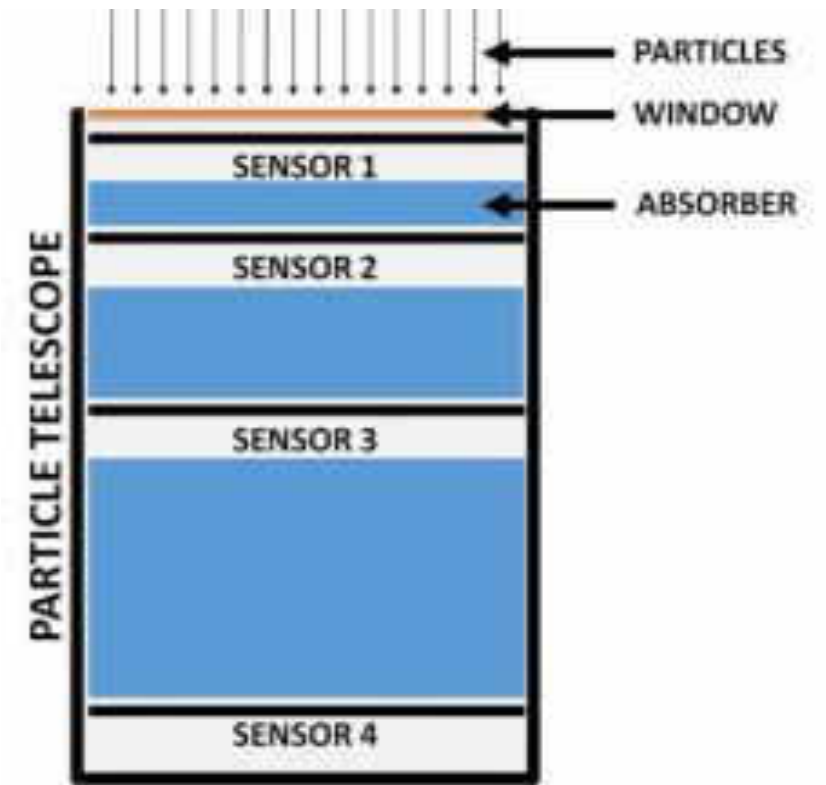
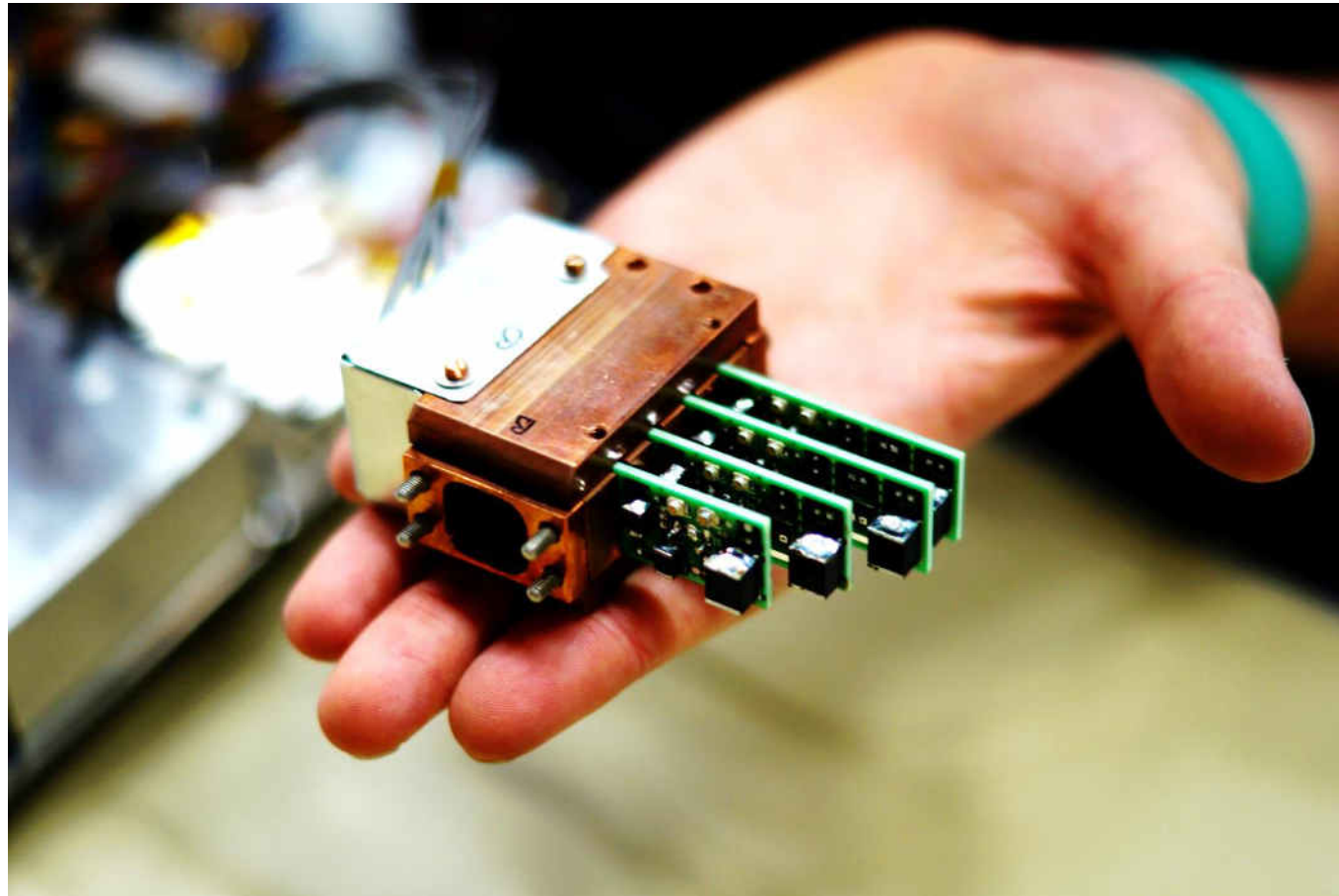
Science (secondary):

- **detection of energetic subatomic particles** in the stratosphere

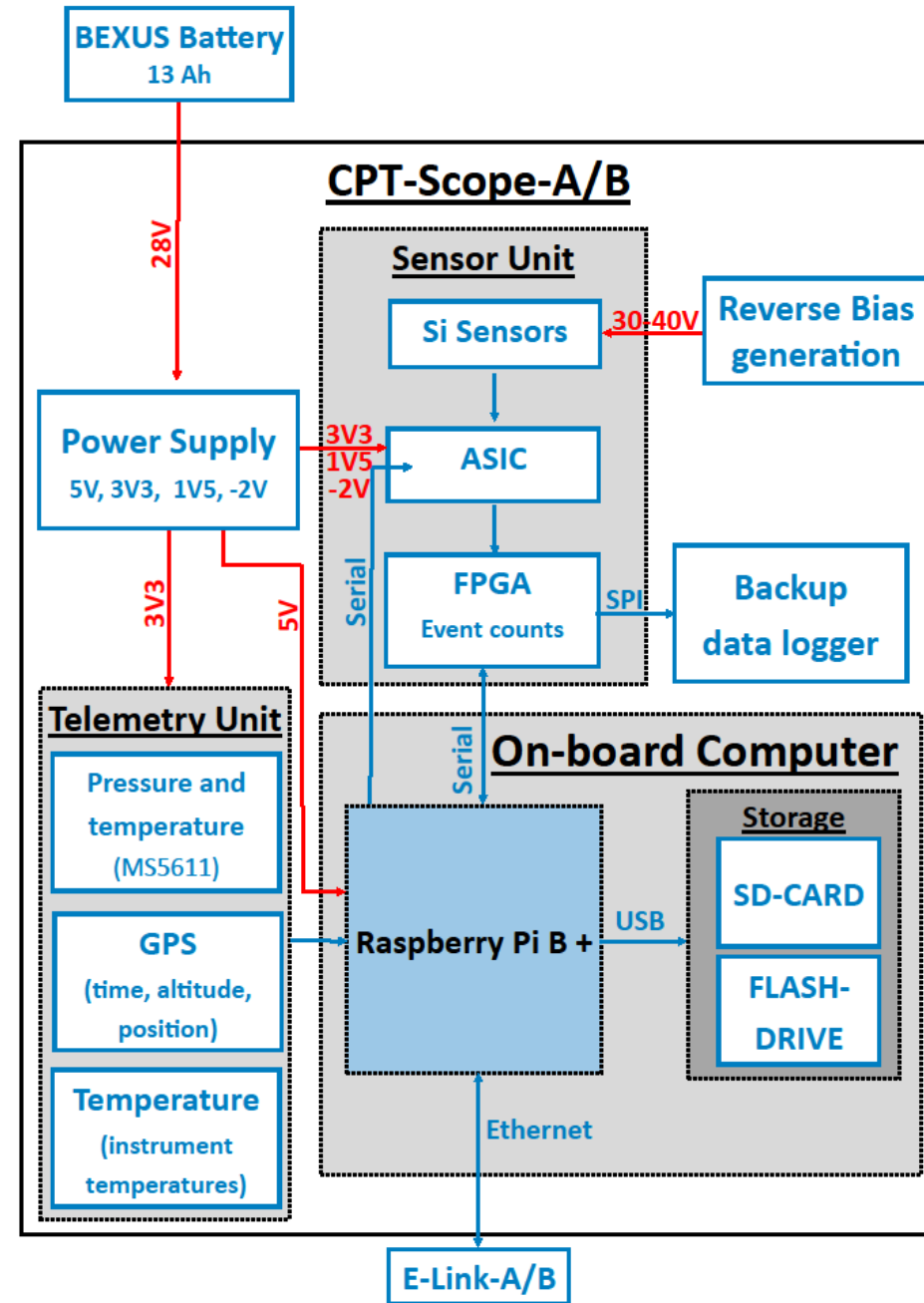
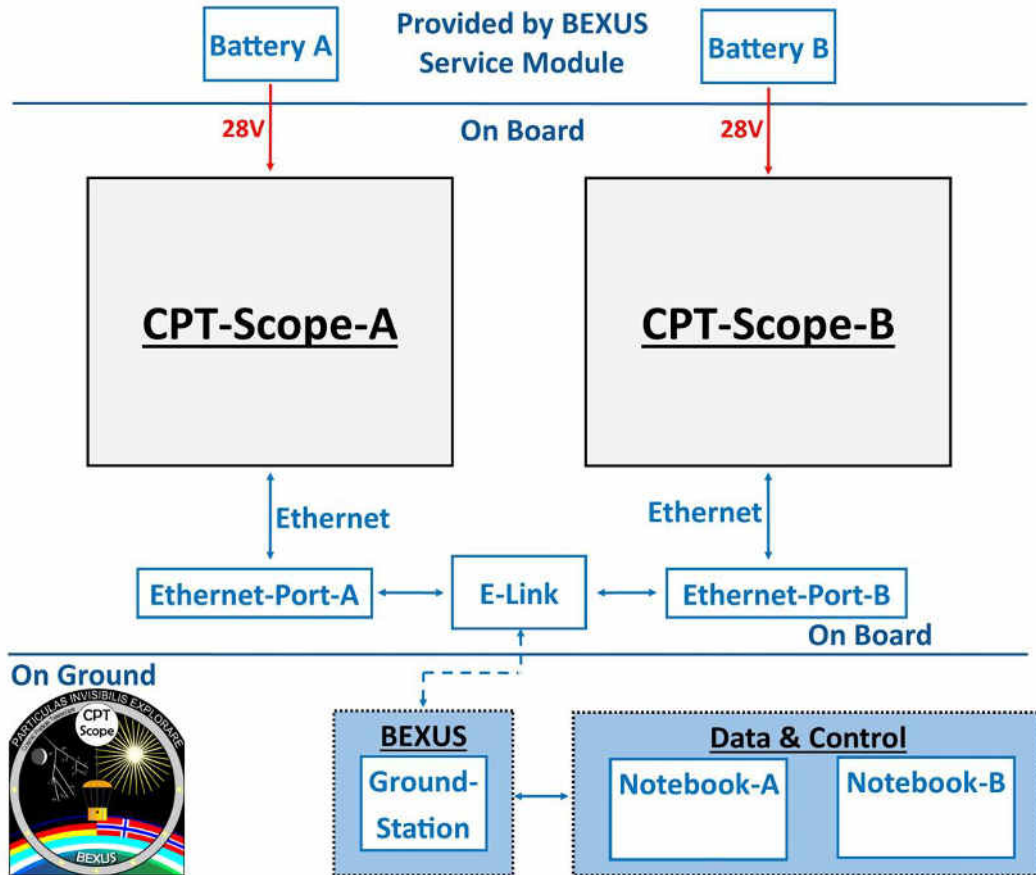


*Space weather,
credit: S. Hill/SOHO/NASA*

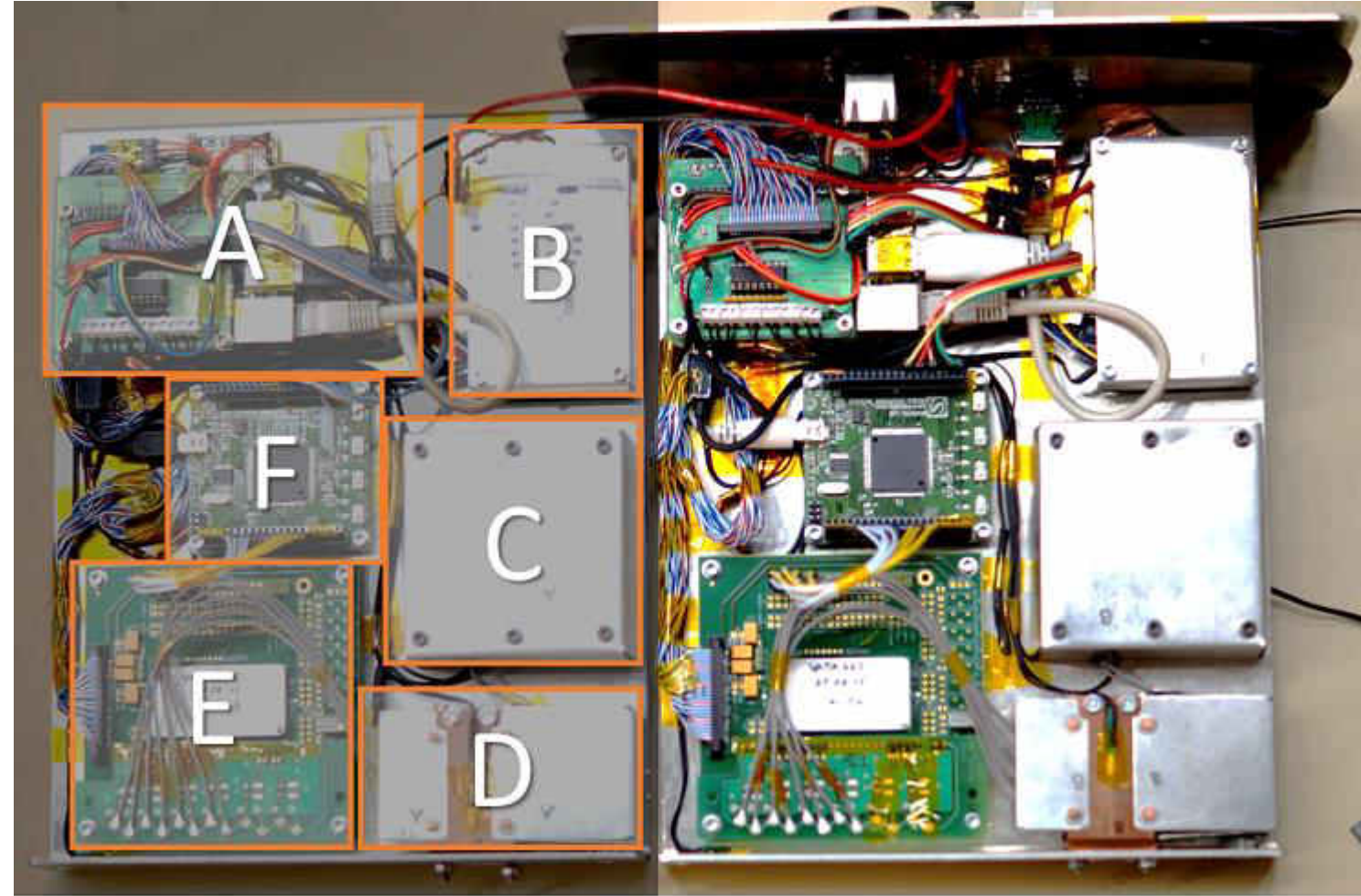
CPT-SCOPE



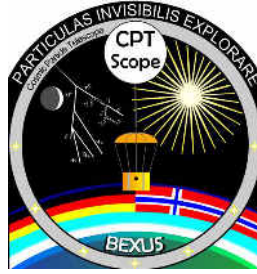
CPT-SCOPE

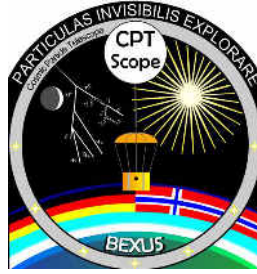


CPT-SCOPE

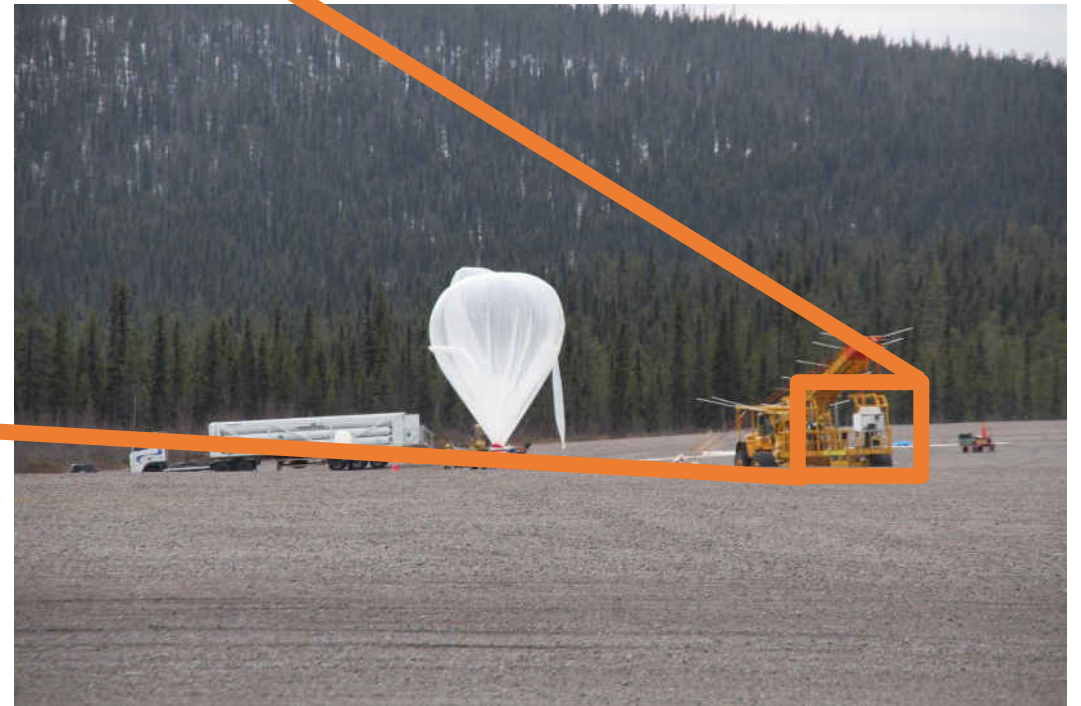


Flight test aboard BEXUS 20, Oct. 10, 2015

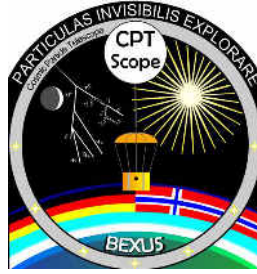




Flight test aboard BEXUS 20, Oct. 10, 2015

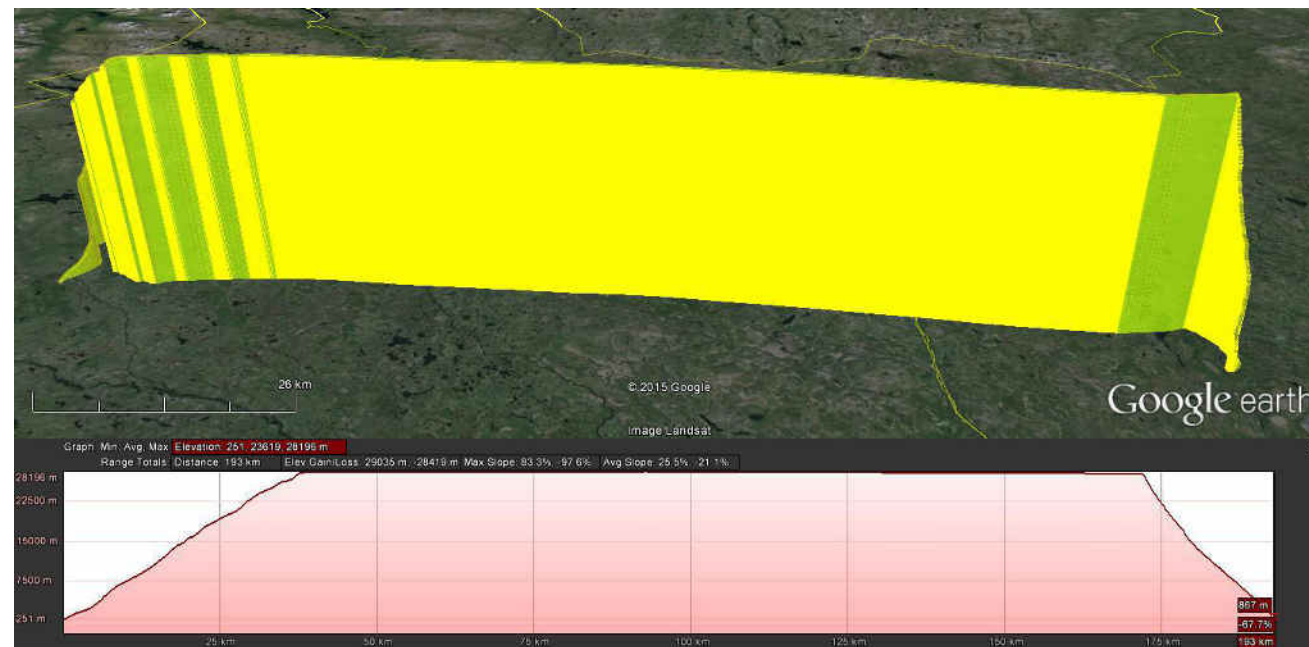
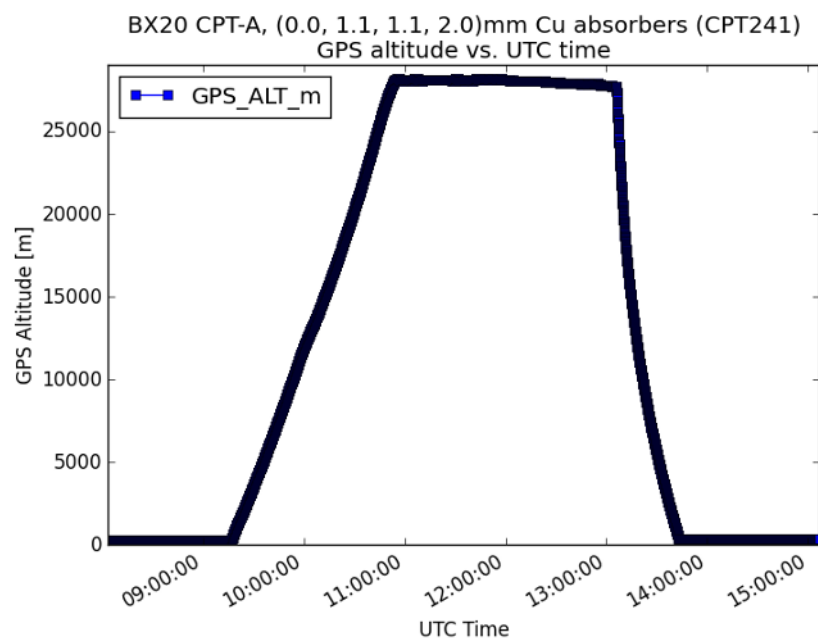


Flight test aboard BEXUS 20, Oct. 10, 2015





Flight test aboard BEXUS 20, Oct. 10, 2015

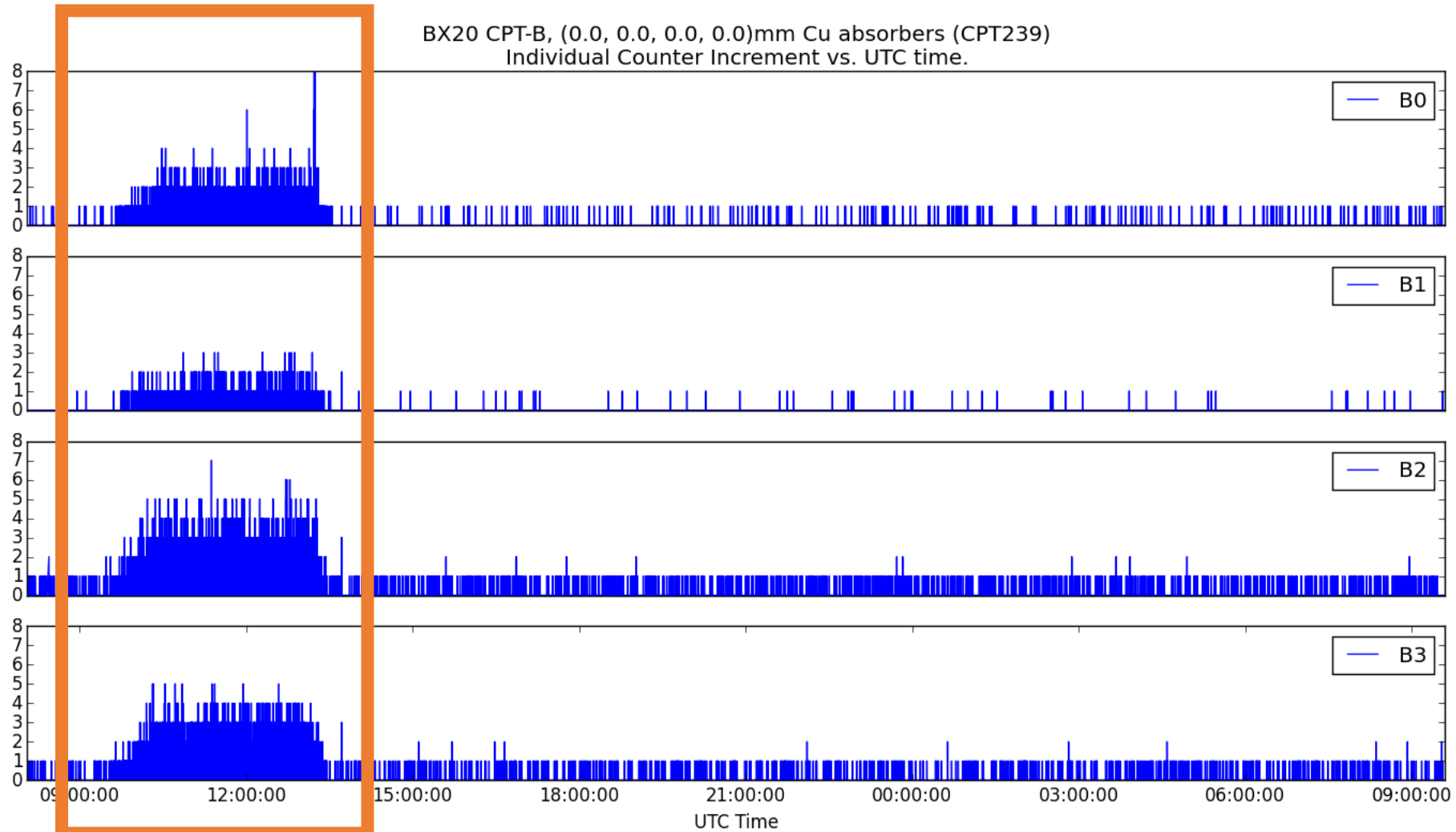


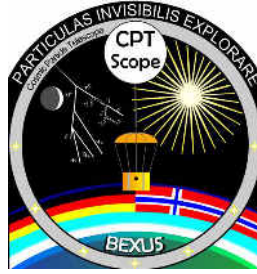
Flight test aboard BEXUS 20, Oct. 10, 2015



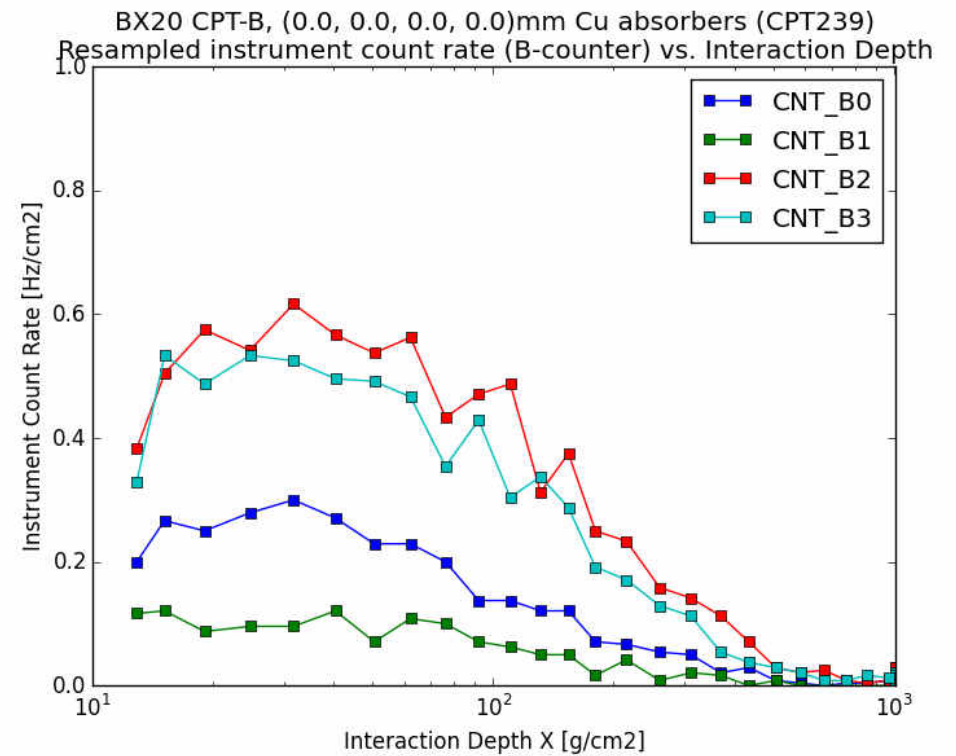
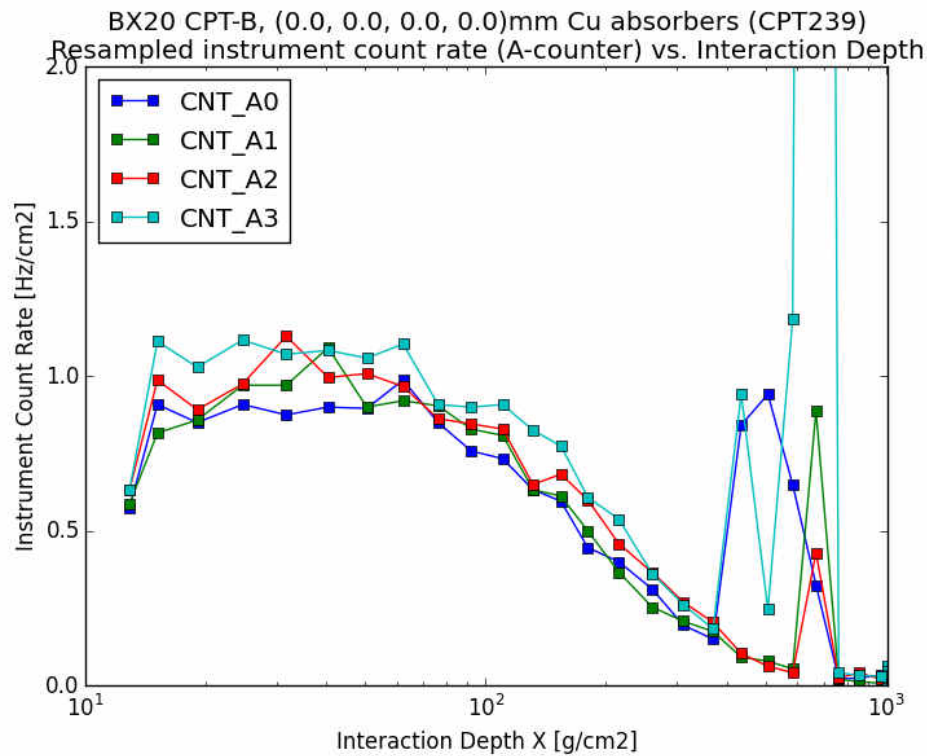


Results: 25+ h operations



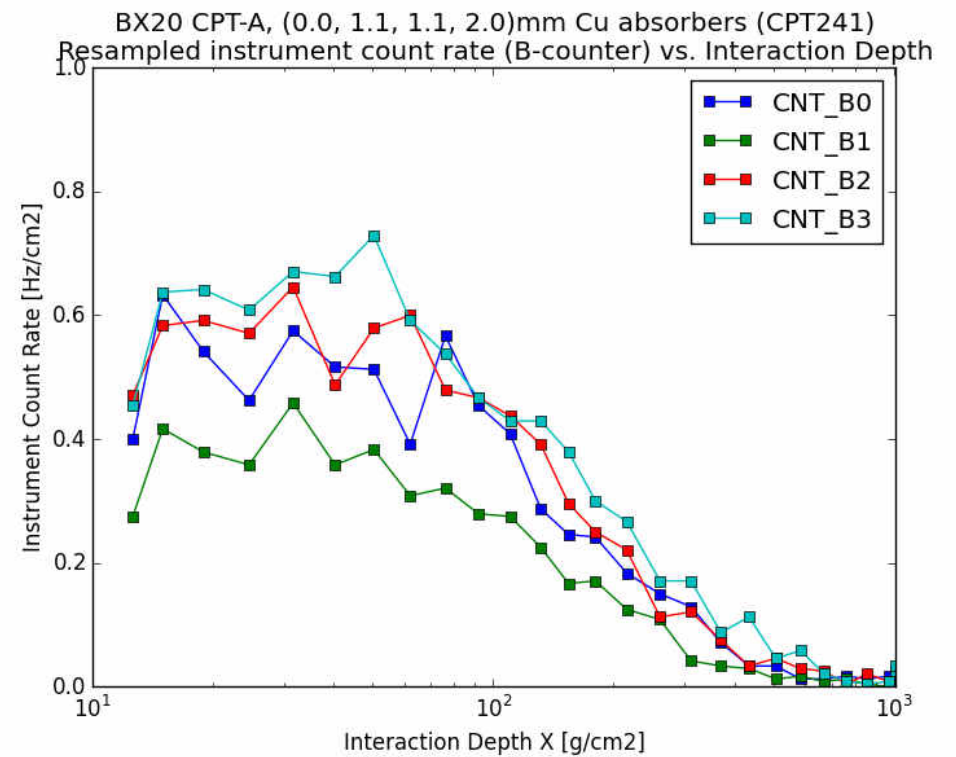
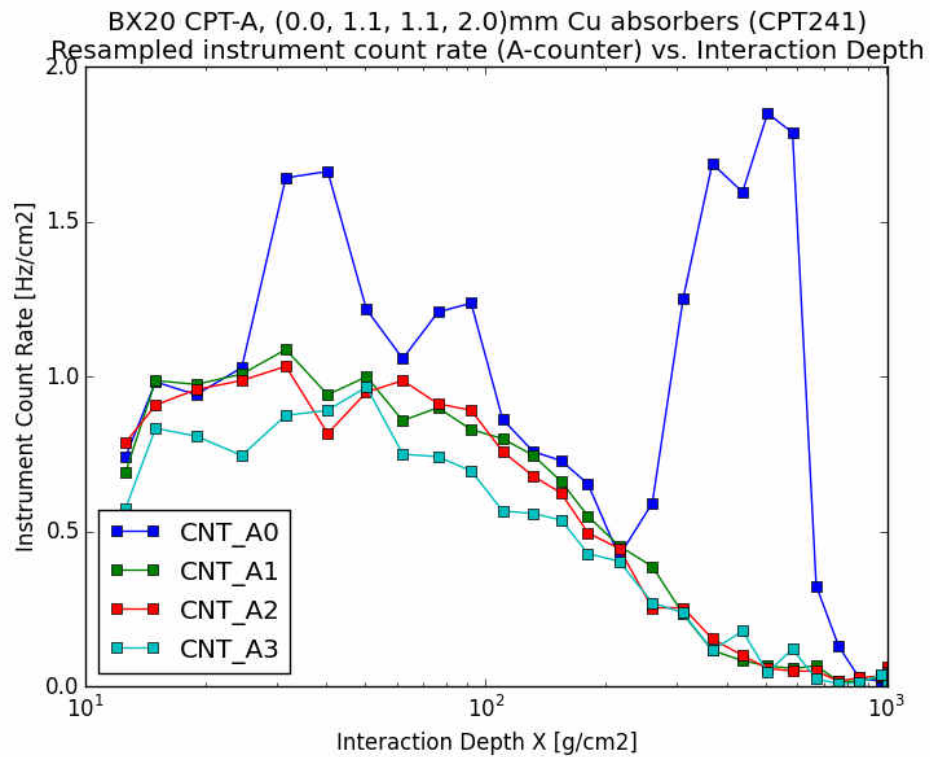


Results: count rate vs. interaction depth - CA



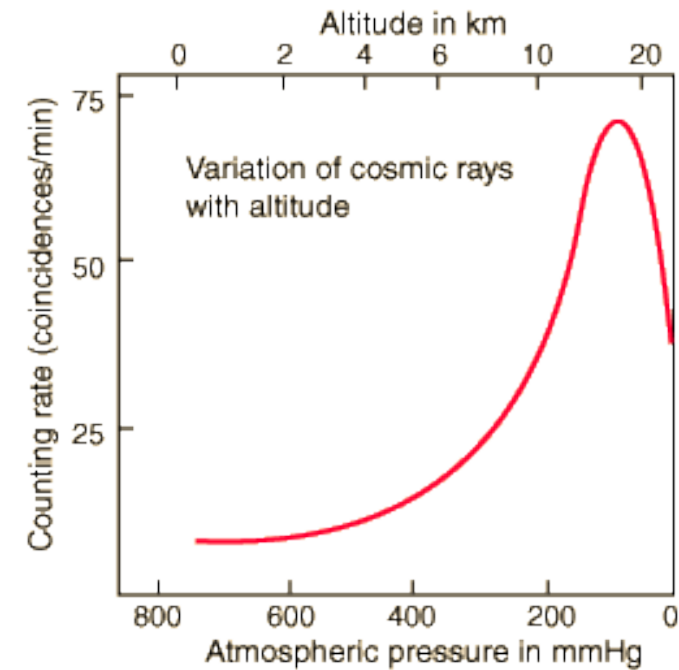
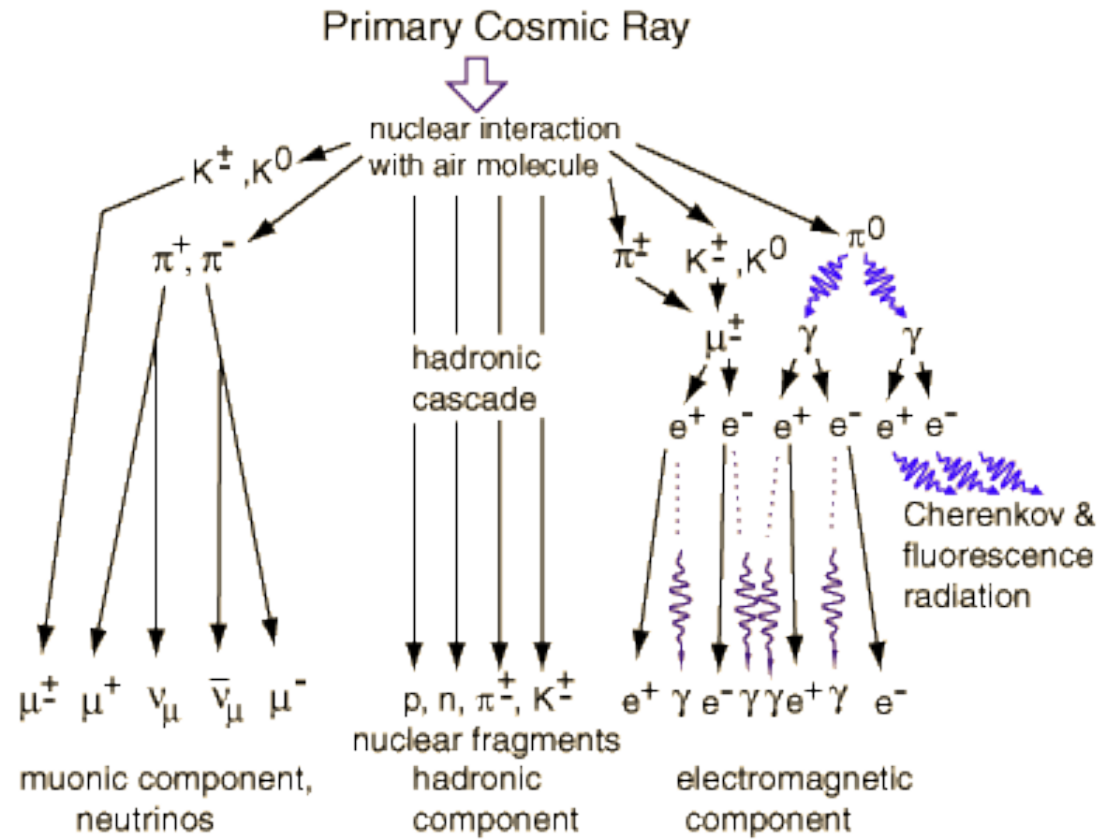


Results: count rate vs. interaction depth - CB

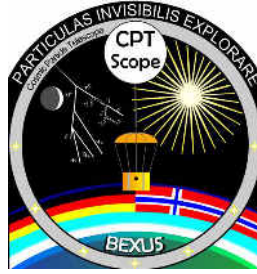




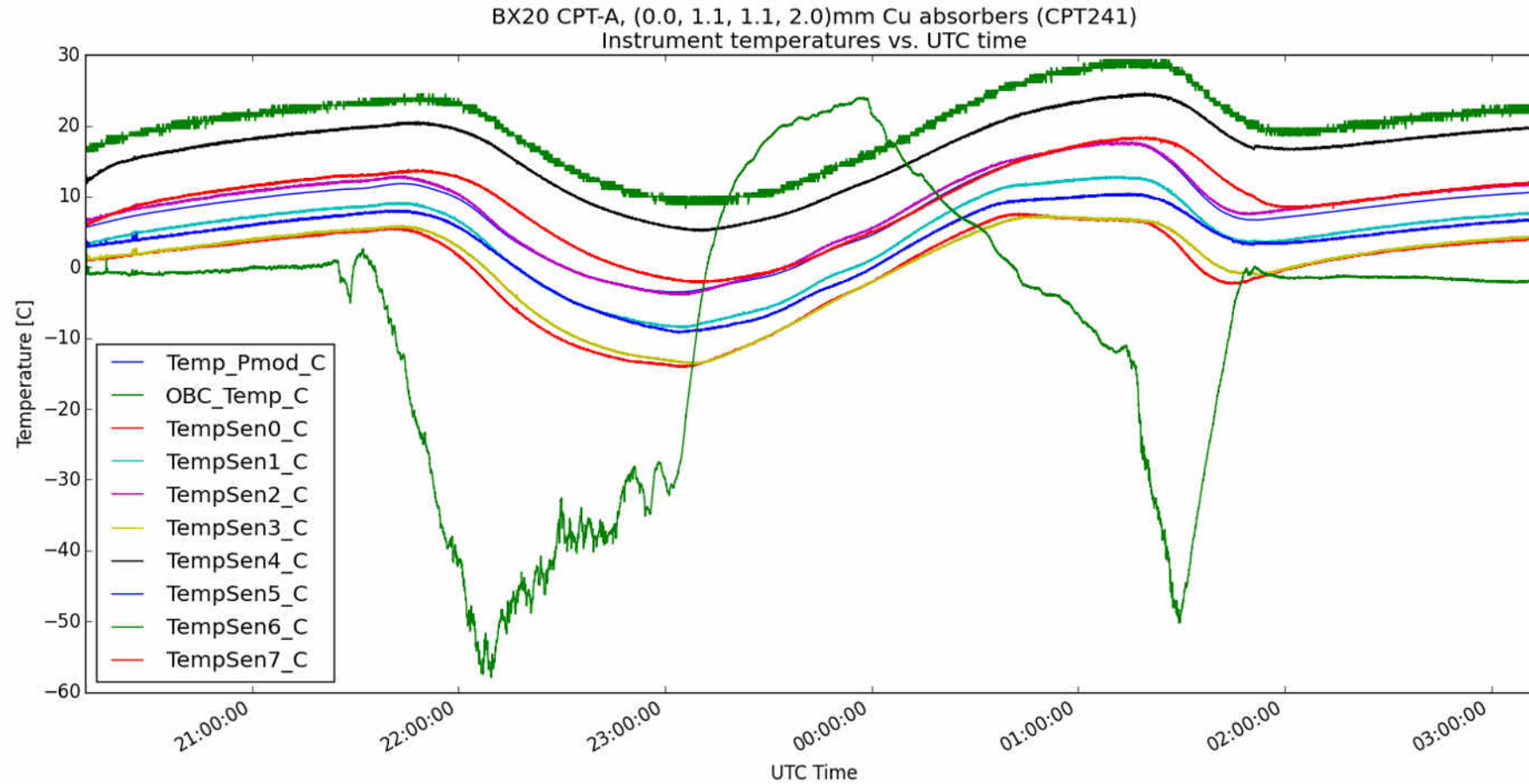
Quick explanation



Cosmic Ray particle shower (left) and number of particles (right), credit: R. Nave, hyperphysics

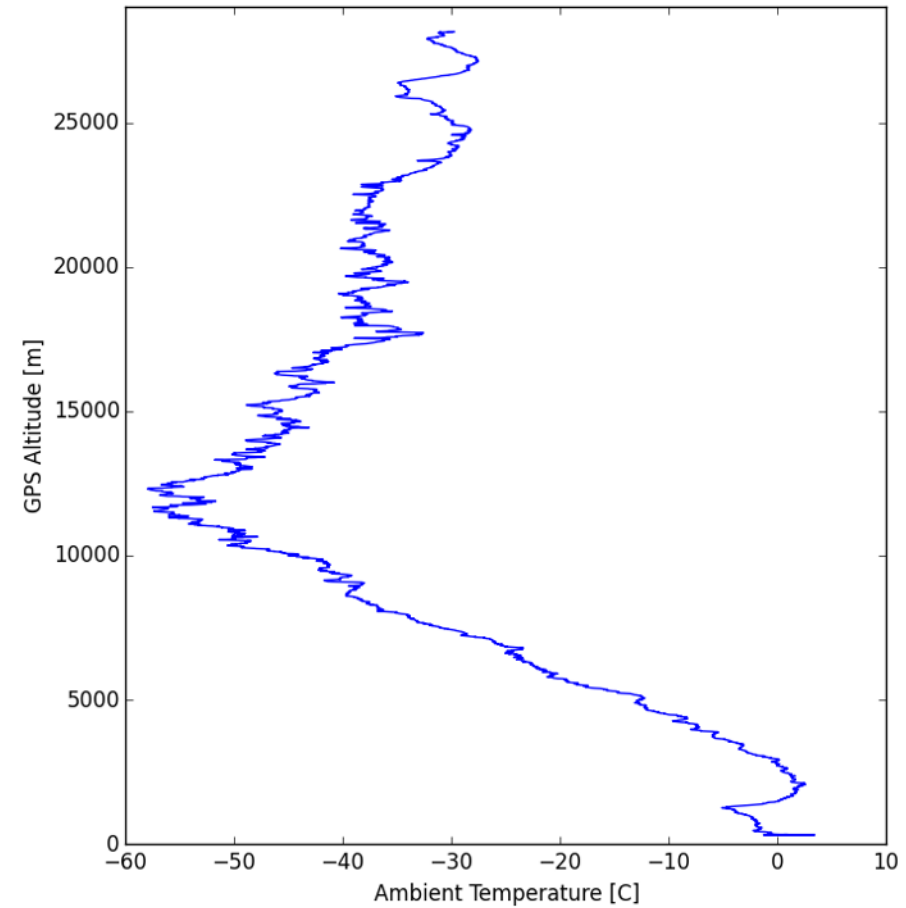
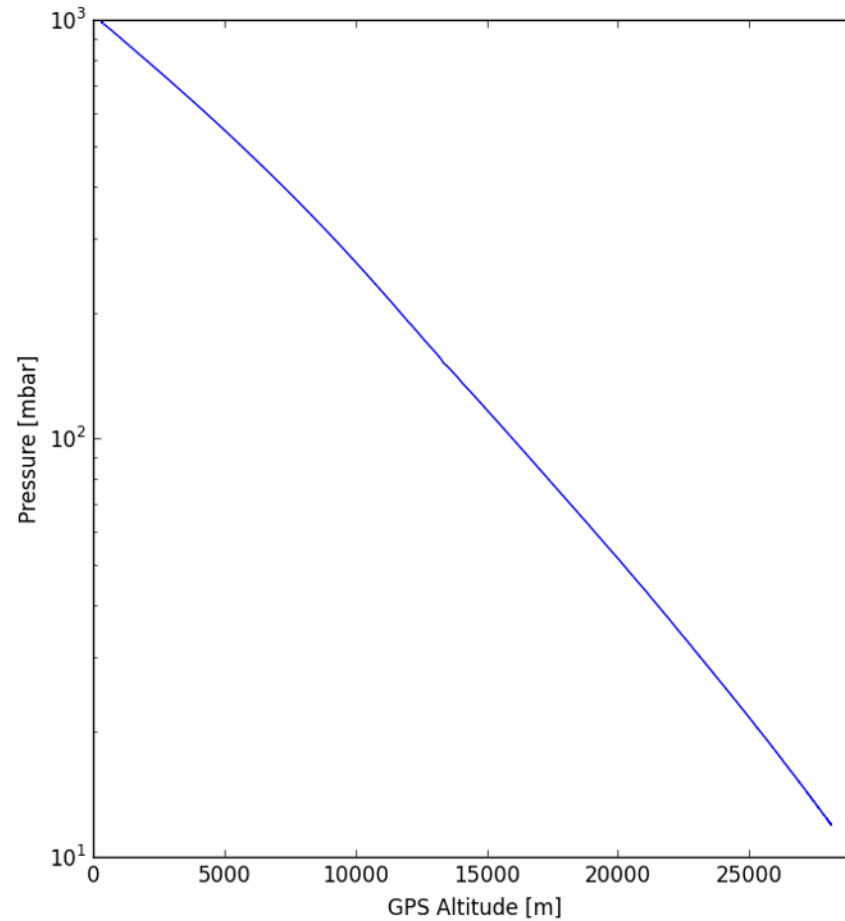


Results: Temperature vs. time - CA

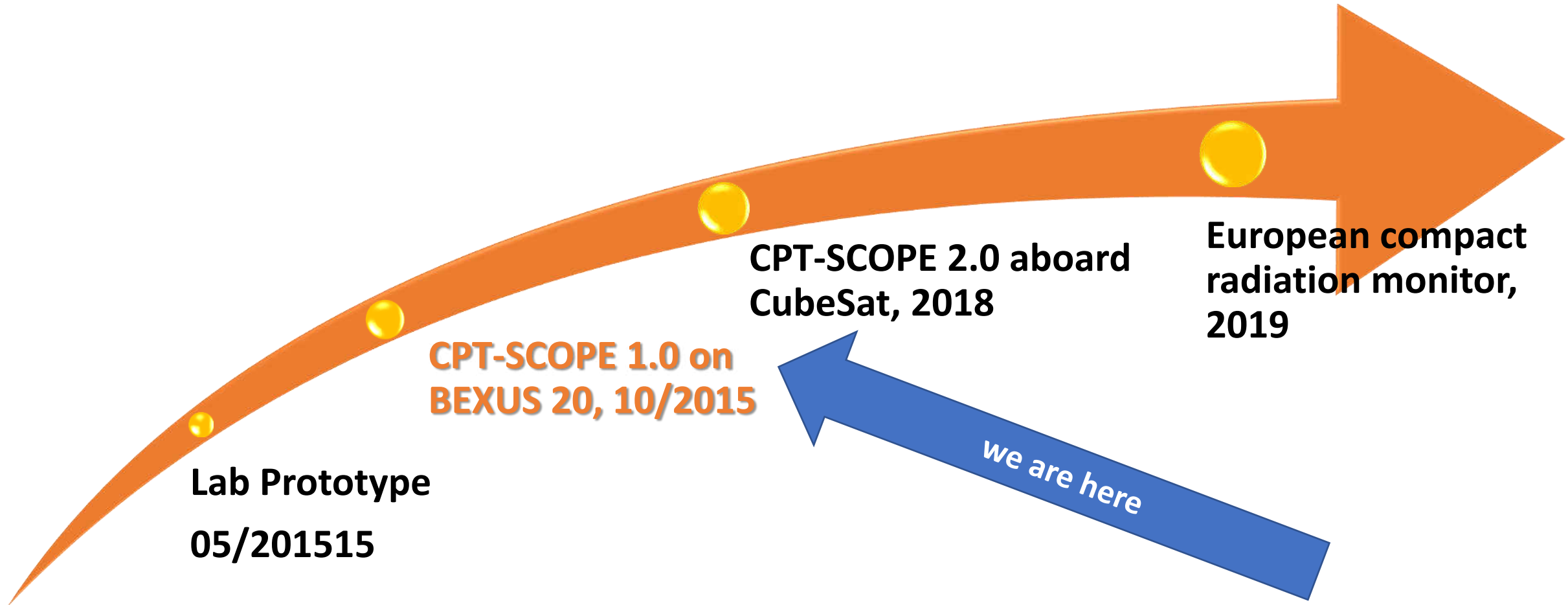
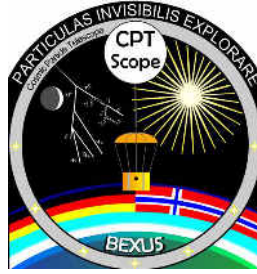




Results: Atmospheric meas. - CA



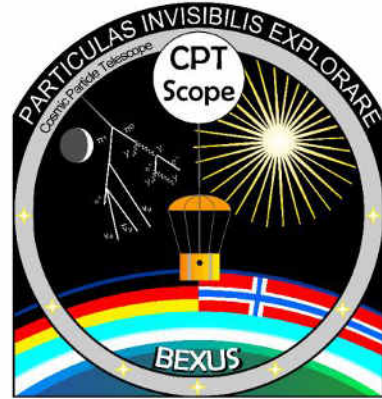
Roadmap



Sponsors and supporters

Timo would like to thank DLR for providing a student conference sponsorship.

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First Sensor





Team CPT-SCOPE



- Michael Beermann (N)
- Anastasiya Dykyy (N)
- Fabian Freyer (G)
- Lucas Kempe (G)
- Julian Petrasch (G)
- Patrick Schönberg (G)
- Johannes Stahn (G)
- Timo A. Stein (N)
- Anton Walter (G)
- Ron Wenzel (G)
- Grunde H. Wesenberg (G)

(G) Germany, (N) Norway

The last slide

Thanks for your attention!

Questions?

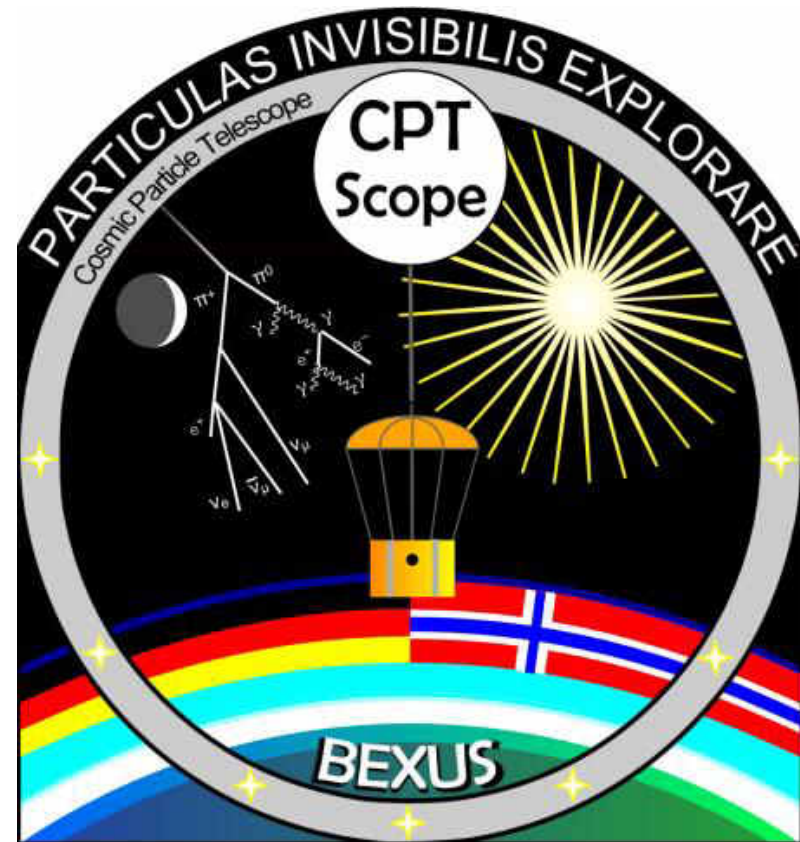
Contact Data:

Timo A. Stein

UiO / Integrated Detector Electronics AS

Oslo, Norway

e-mail: timo.stein@ideas.no



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