CALICE absorber structures built/owned by CERN

Note that these structures take up significant storage space. Moreover, the tungsten absorber stack represents financial value.

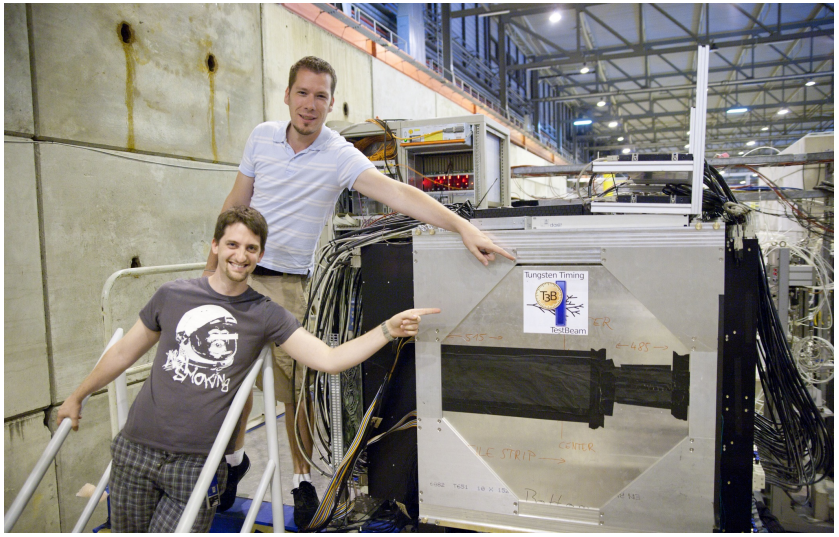
For discussion at CALICE IB:

- Are these structures still needed?
- For what reason and when will they be used again in the future?

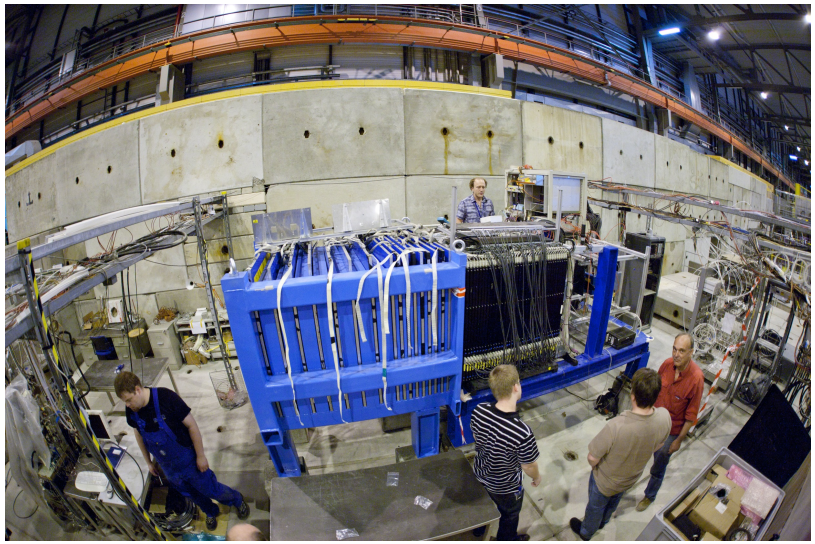
Lucie Linssen, September 30th 2019

CERN CALICE absorbers

AHCAL + tungsten: first installation at PS, 2010



T3B, tungsten timing testbeam



AHCAL (tungsten) + tail catcher @ CERN SPS 2011

DHCAL (tungsten + tail catcher @ CERN, 2012

Tungsten absorber structure

Described in CALICE publication: https://iopscience.iop.org/article/10.1088/1748-0221/10/12/P12006

38 layers of absorber plates.
Each absorber plate is 1 cm thick.
Tungsten alloy is 92.99% tungsten, 5.25% nickel, and 1.76% copper, with a density of 17.8 g/cm^3.
Nuclear interaction length of this alloy is λ_I = 10.80 cm and the radiation length is X_0 = 0.39 cm.

Absorber structure was assembled directly on base platform

Lateral tungsten shape is "octagonal", made up of 5 full-tiles and 4 half-tiles of basic dimension 27*27 cm^2. Total width 81 cm.
Glued on 1 mm thick steel (?) plate.

Photos CERN edms document nr 1092998

Tail catcher absorber structure (Fe)

Built in 2011, copied from the original CALICE tail catcher (because the original was in use at Fermilab in 2011).

~5.8 interaction lengths (?)