





EP-DT Detector Technologies

# Mission at CERN 04/11/24-10/11/24

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## PURPOSE





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First week:

- Determine Z5 behaviour after short vacuum regenerations
- Testing the setup with new sensors:
  - -) 2 Vaisala DMT143 for humidity
  - -) Mass Flow Meter OMRON D6F-P0010A2
  - -) Pressure sensor

Second and Third week:

• Test using Z3 as adsorber for humidity and Z5 for methane

### GC CLIBRATION FOR 4509 ppm METHANE



### Bottle of Air $(N_2 + O_2)$ and Methane at 4509 ppm directly connected to Gas Chromatograph (GC)

Bronkhorst pressure = 100 mbar

	PPU AREA	PPU to ppm CONVERSION FACTOR		MS AREA	MS to ppm CONVERSION FACTOR
AVERAGE	5149	0,874	AVERAGE	1958	2,304
DEV. STD	27	0,004	DEV. STD	13	0,017
AVG DEV. STD	10	0,002	AVG DEV. STD	5	0,006

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### Setup for first week:



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## FIRST MEASUREMENT

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### 10 cycles with the cartridge of Z5

### Data during measurement:



## **PRELIMINARY RESULTS**



Regeneration time: 40 min

Methane adsorbed before first appearance of the peak in the chromatogram of 10 measurements:



Complete saturation after  $\sim$ 40 mL of CH4

## MEASUREMENT

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10 cycles with the cartridge of Z5

Vaisala 2 reads more humidity than Vaisala 1  $\rightarrow$  there is a leak





### We changed plastic pipes:



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## FIRST MEASUREMENTS

10 cycles with the cartridge of Z5

Vaisala 2 reads more humidity than Vaisala 1  $\rightarrow$  there is a leak

### We changed plastic pipes:







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## SECOND MEASUREMENT SETUP

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### Setup for second week:



### Air + H20

Air+CH4<sup>10</sup>

# Ratio of diluted CH4 set using rotameters at 50 % with respect to the CH4 bottle at 4509 ppm

Measurements of adsorption with CH4 diluted with mixture of Air + H2O

### GOAL:

FIRST MEASUREMENT SETUP



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First results:





Unexpected beaviour  $\rightarrow$ 

## High temperature regeneration and bypass line after vacuum regeneration

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Bypass line to get atmospheric pressure:



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CH4 adsorbed before first peak

Total of 5 runs, same behaviour

Anomaly:

Complete saturation with less CH4  $\sim$  25 mL  $\,$  vs  $\sim$  40 mL previous measurement