

 **Kubeflow**

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build version v1beta1

 **engine-eren** (Owner) ▼



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[ml.docs.cern.ch](#)
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Recent Notebooks

 **pytorchjob**
Accessed 3/23/2022, 3:03:24 PM

 **model_testing.ipynb**
Accessed 3/23/2022, 2:36:21 PM

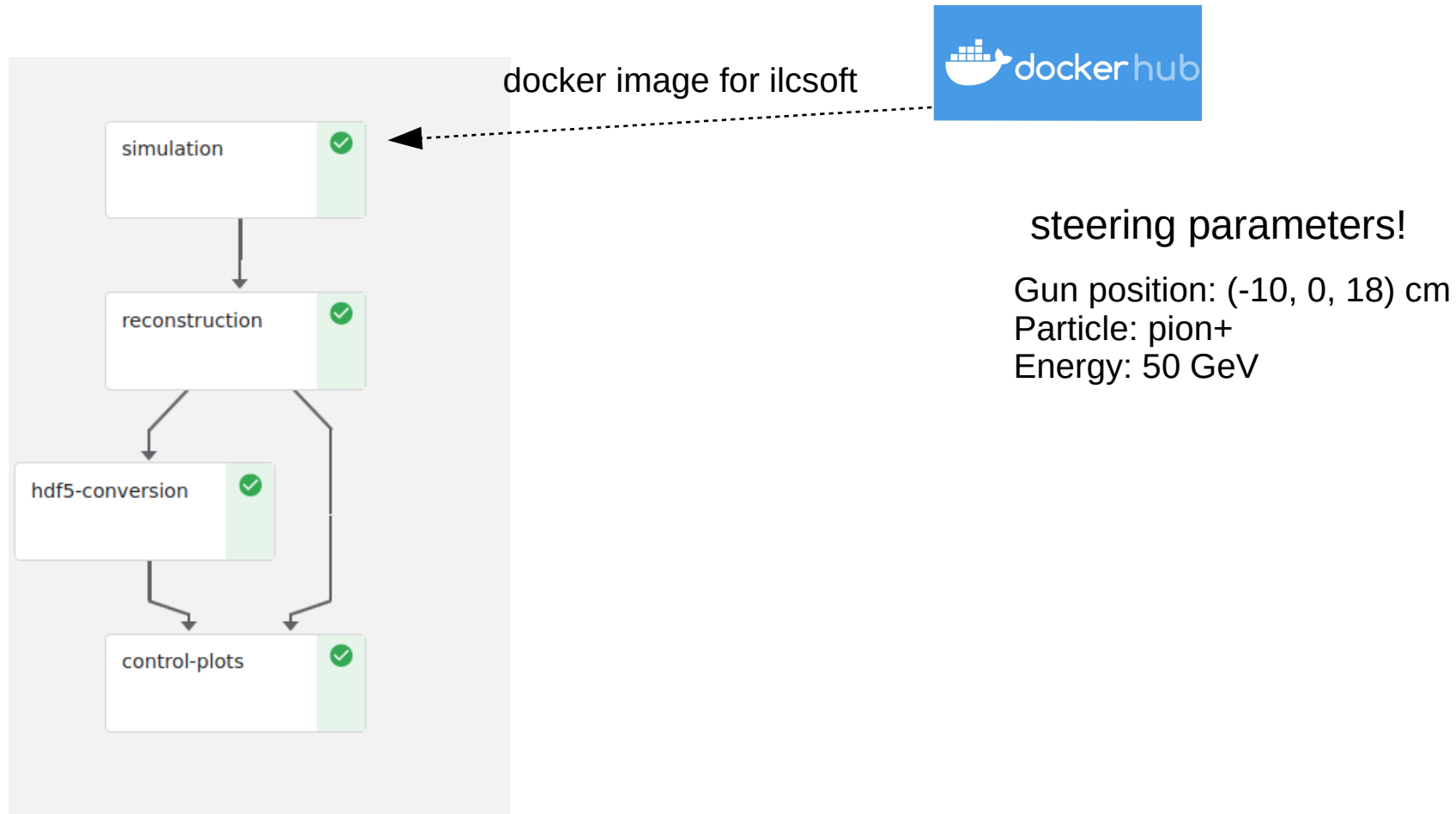
 **models**
Accessed 3/23/2022, 2:35:08 PM

 **kale.log**
Accessed 3/23/2022, 2:12:17 PM

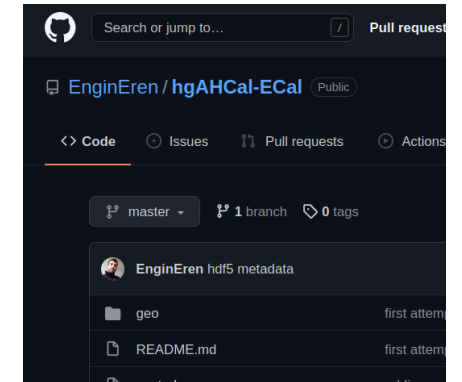
 **hgAHCAL-ECAL**
Accessed 3/18/2022, 2:49:40 PM

Kubeflow at *ml.cern.ch*

Data pipeline and experiment

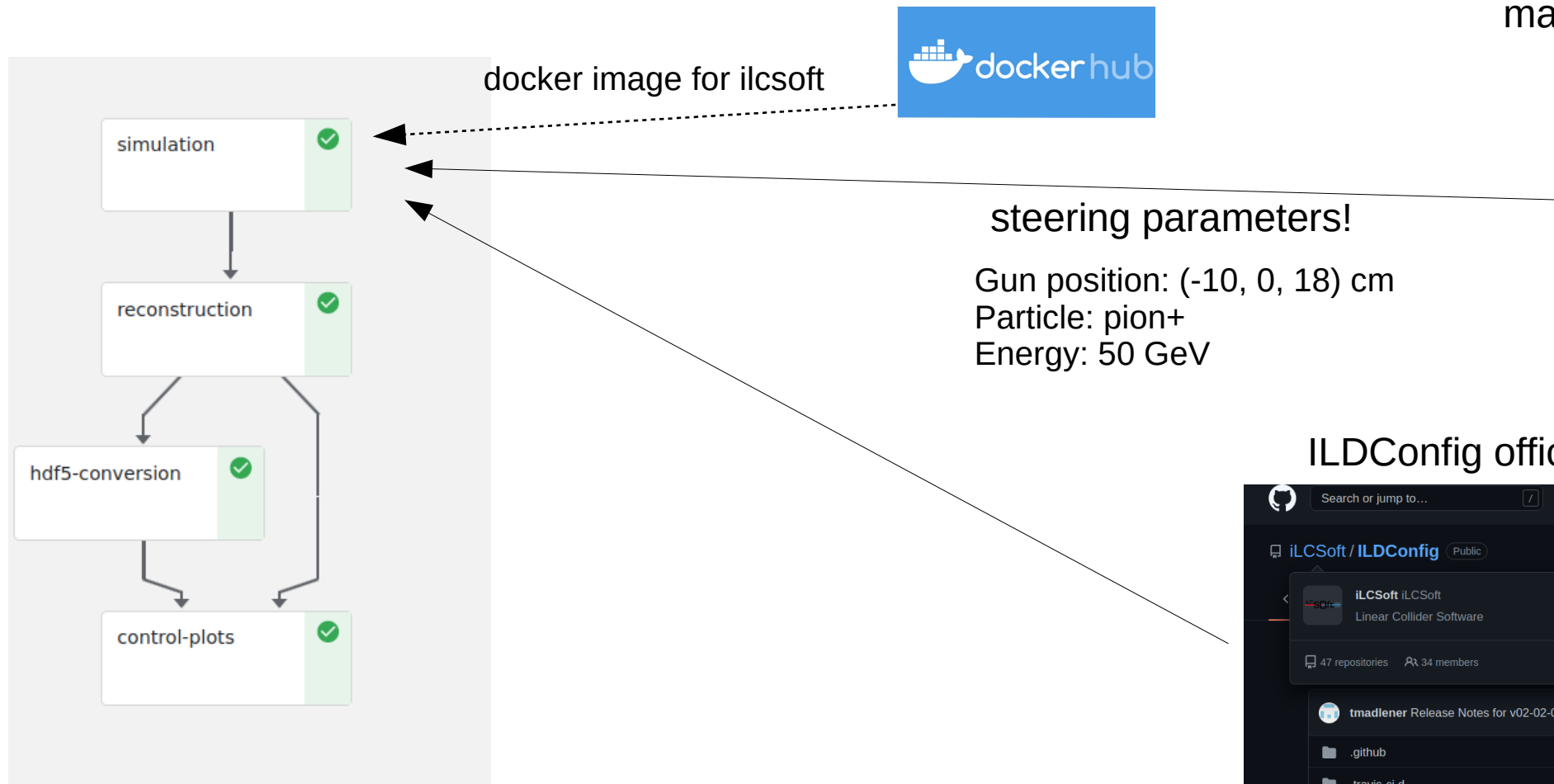


main github repo

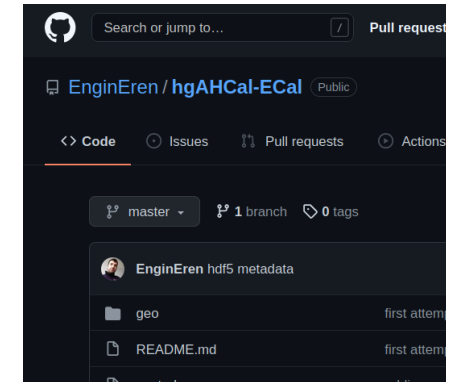


Kubeflow at *ml.cern.ch*

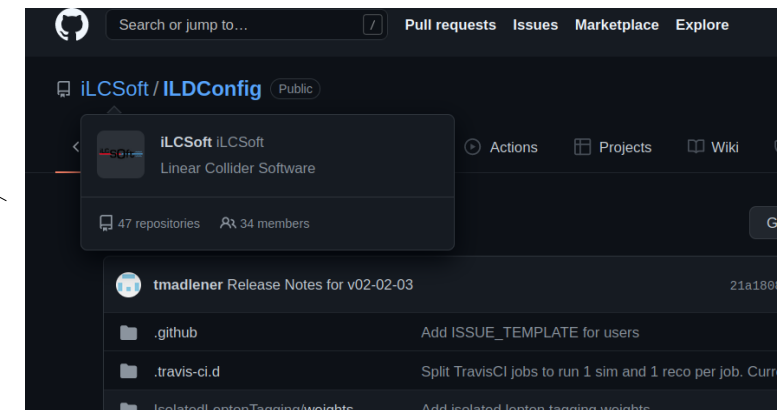
Data pipeline and experiment



main github repo

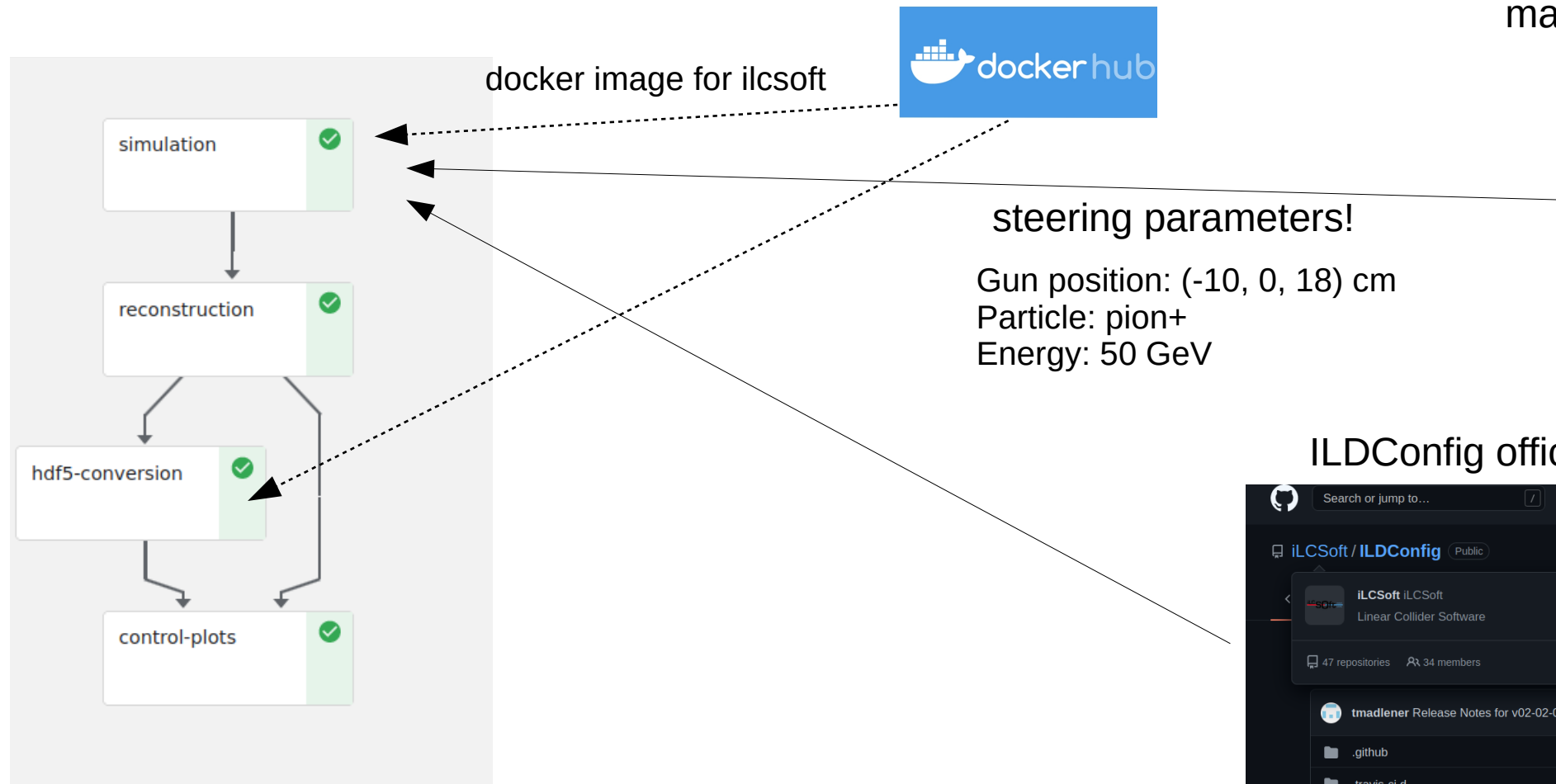


ILDConfig official repo

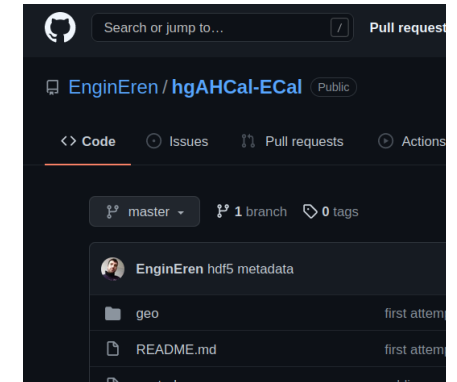


Kubeflow at *ml.cern.ch*

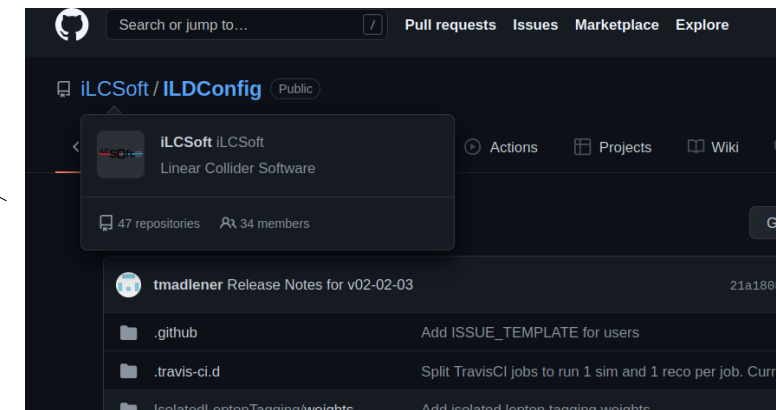
Data pipeline and experiment



main github repo



ILDConfig official repo



Writing all hdf5 files to **CERN-EOS**

More jobs



🔧 Pipelines

✓ Experiments

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Experiments > hadron_showers

← ✓ Run of HCAL_ECAL_eosAccess_version_at_2022-03-07T09:54:25.340Z (5538)

Retry

Clone run

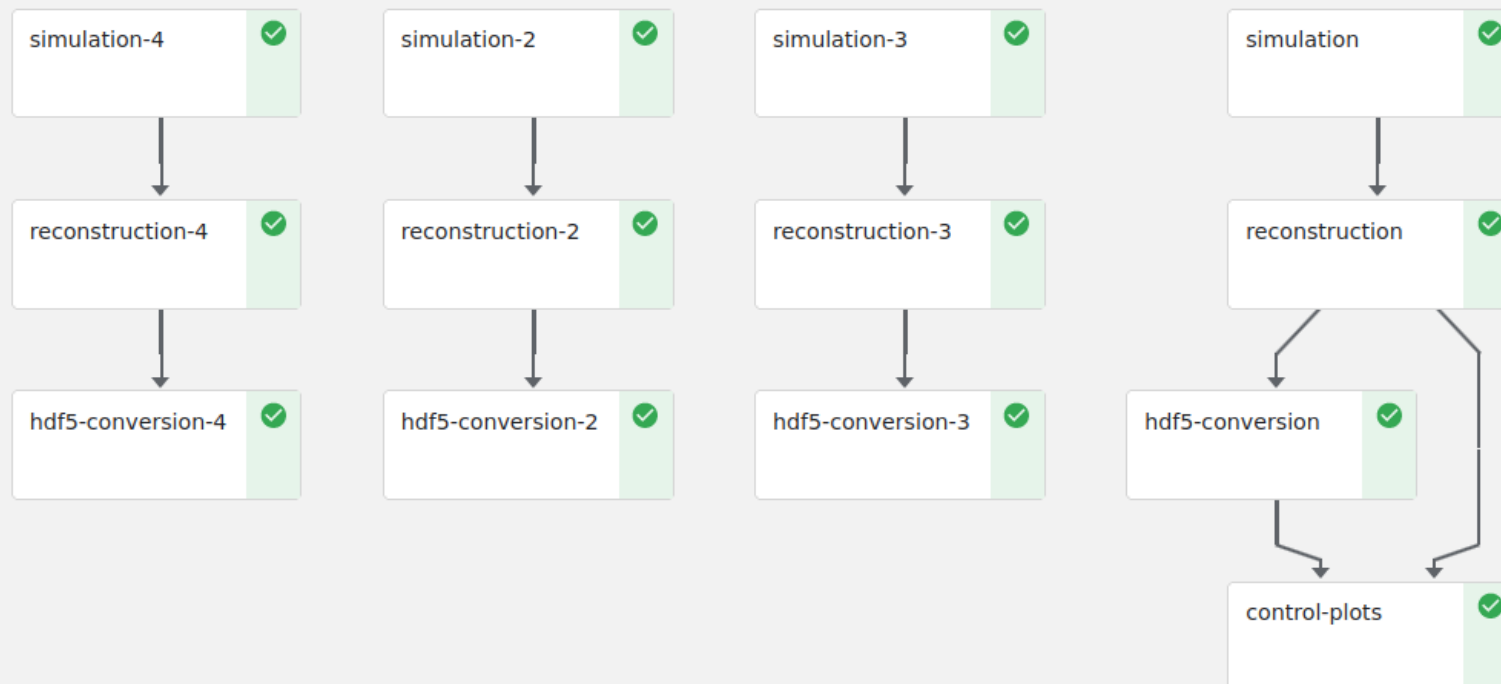
Terminate

Archive

Graph

Run output

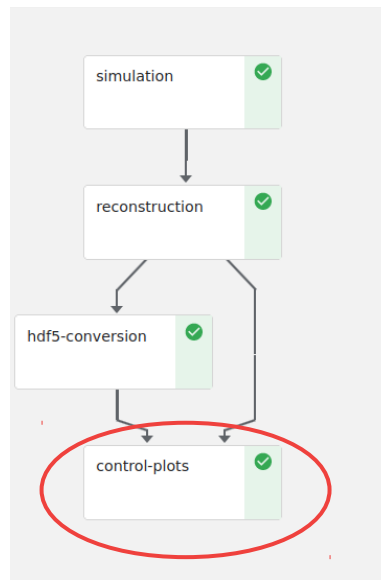
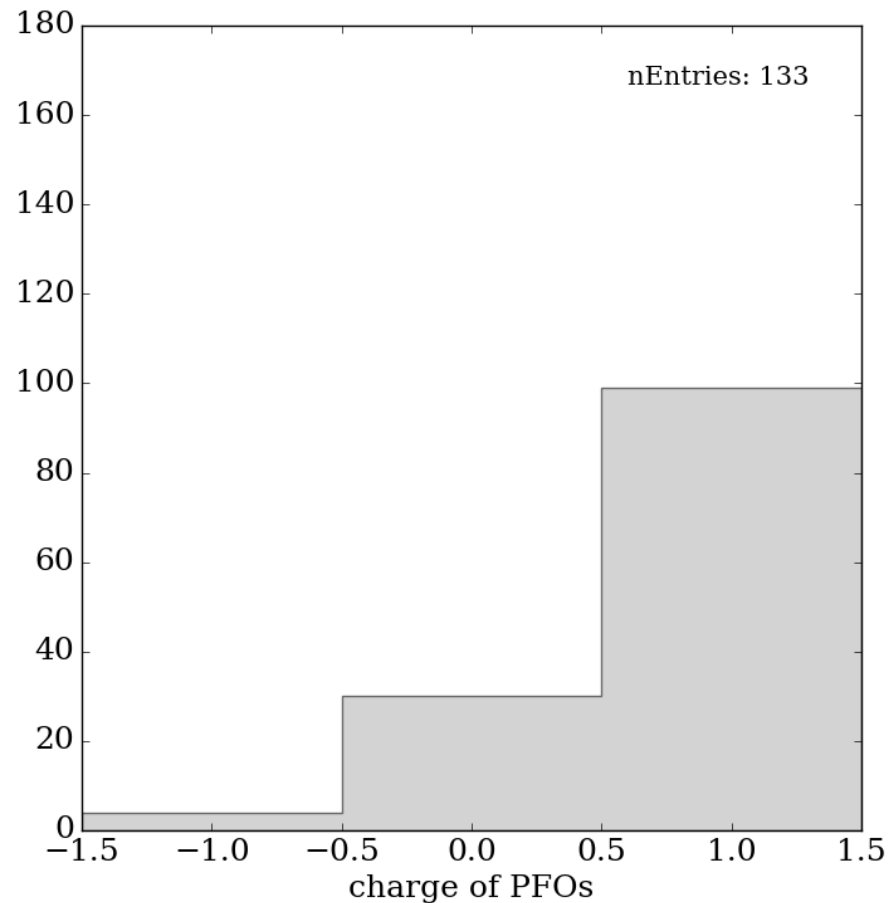
Config



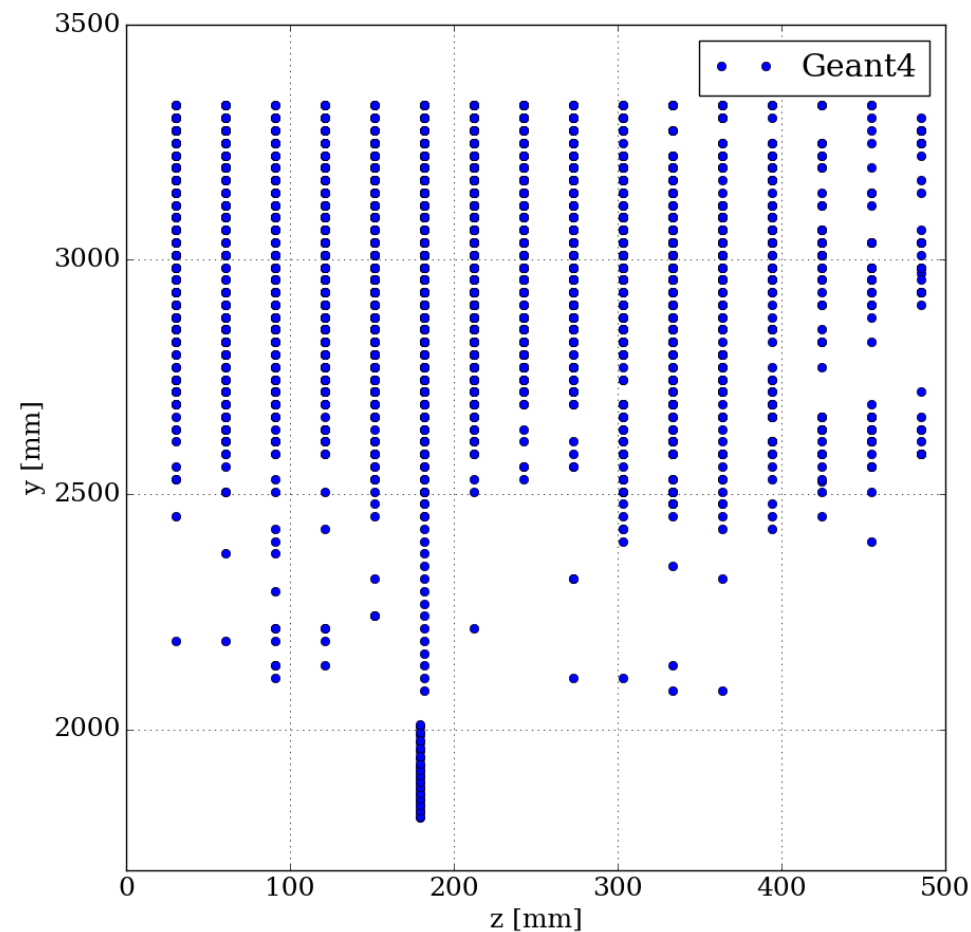
Writing all hdf5 files to CERN-EOS

Control Plots (some examples)

Pandora PFO:

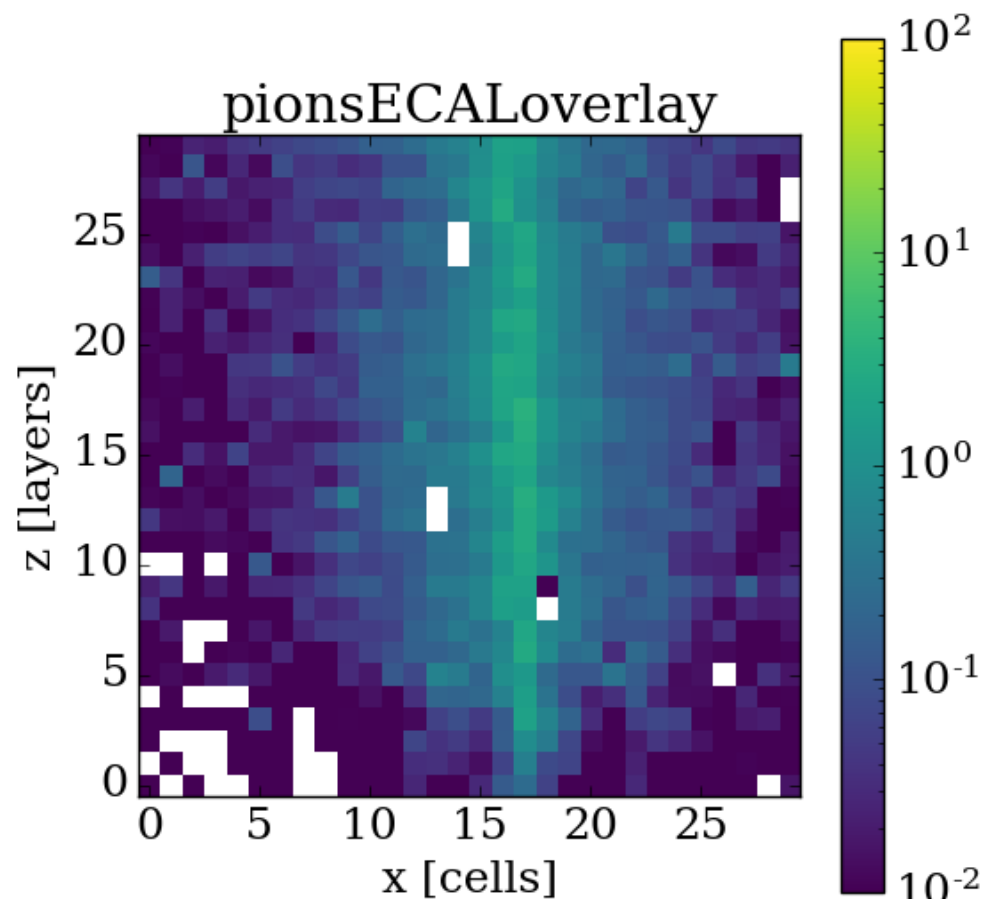


Simulated hits:

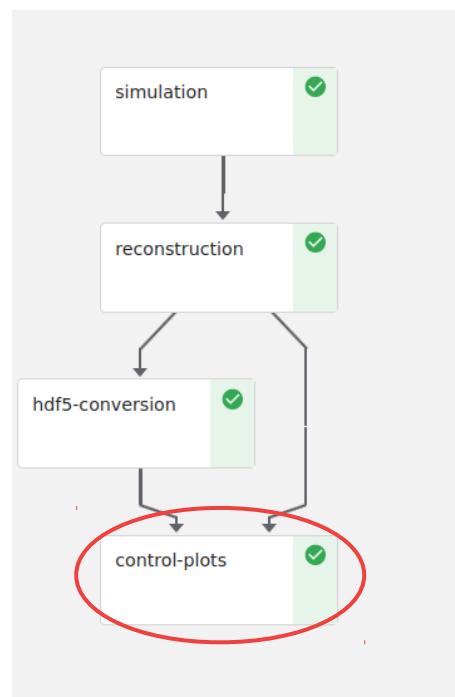
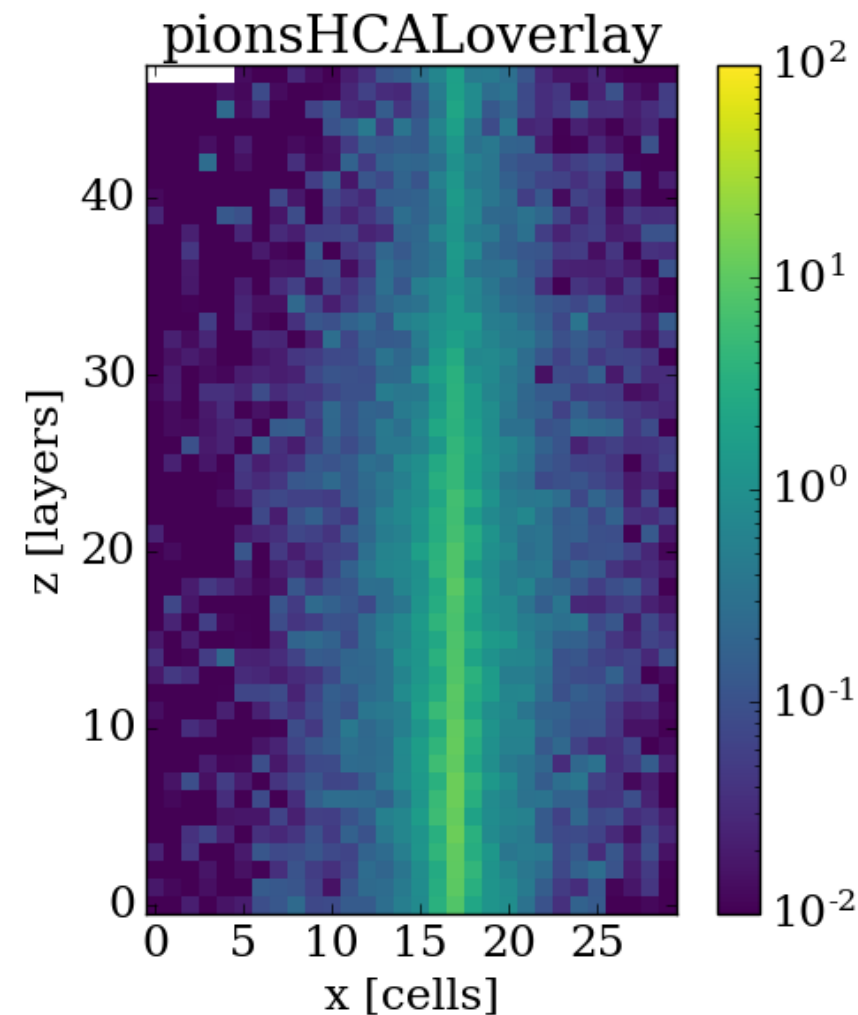


Control Plots (some examples)

ECAL (z-x)



HCAL (z-x)



Training: First prototype in the notebook server (Jupyter Lab)

The screenshot displays the Jupyter Lab interface. The main area shows a notebook titled 'model_testing.ipynb' with a code cell containing the following Python code:

```
[1]: import torch
import torch.nn as nn
import torch.nn.parallel
import torch.nn.functional as F
from torch.autograd import Variable
from torch.utils import data

class DCGAN_G(nn.Module):
    """
    generator component of WGAN
    """
    def __init__(self, ngf, nz):
        super(DCGAN_G, self).__init__()

        self.ngf = ngf
        self.nz = nz

        kernel = 4

        # input energy shape [batch x 1 x 1 x 1] going into convolutional
        self.conv1_1 = nn.ConvTranspose3d(1, ngf*4, kernel, 1, 0, bias=False)
        # state size [ ngf*4 x 4 x 4 x 4]

        # input noise shape [batch x nz x 1 x 1] going into convolutional
        self.conv1_100 = nn.ConvTranspose3d(nz, ngf*4, kernel, 1, 0, bias=False)
        # state size [ ngf*4 x 4 x 4 x 4]

        # outs from first convolutions concatenate state size [ ngf*8 x 4 x 4]
        # and going into main convolutional part of Generator
        self.main_conv = nn.Sequential(

            nn.ConvTranspose3d(ngf*8, ngf*4, kernel, 2, 1, bias=False),
            nn.LayerNorm([8, 8, 8]),
```

On the right side of the notebook, there is a 'Notebook Servers' panel showing a table of available servers:

Status	Name	Age	Image	CPU	Memory	Volumes	
✓	model-testing-gpu-pytorchv2	5 days ago	pytorch-notebook-gpu-1.8.1:v0.6.1-30	1	4.0Gi		CONNECT

Below the table, a sidebar menu for Kubeflow is visible, with 'Notebook Servers' highlighted by a red circle. The menu items are: Home, Pipelines, Notebook Servers, Katib, Artifact Store, and Manage Contributors.

The bottom status bar shows 'Python 3 | Idle' and 'Mode: Command'. The bottom right corner indicates 'Ln 1, Col 1 model_testing.ipynb'.

Distributed training (DDP) with pytorch job

Master :

- volumes : EOS config/secret
- docker image: gitlab-registry.cern.ch/eneren/../
- python command: `regressor.py --epochs 2`
- nvidia-driver

Worker

- same..
- replicas: 1



Engin Eren > Pytorchjob

✓ You pushed to `test` at [Engin Eren / Pytorchjob](#) 48 minutes ago

Create merge request

gitlab.cern.ch

P

Pytorchjob

Project ID: 132781



☆ Star 0

🍴 Fork 0

49 Commits 2 Branches 0 Tags 297 KB Files 699 KB Storage

master

pytorchjob /

+

History

Find file

Web IDE

↓

Clone



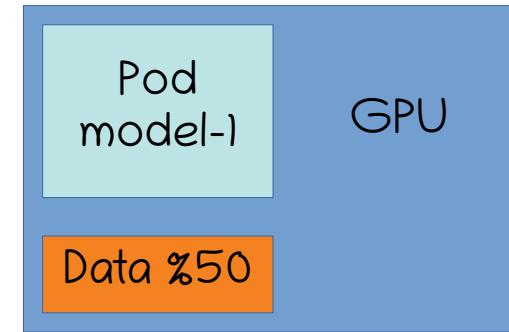
Merge branch 'eneren-master-patch-57749' into 'master'

Engin Eren authored 23 hours ago

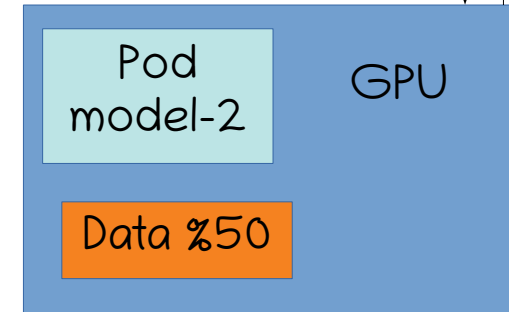
049f80f3



Master Node



Worker-node



Distributed training: Building the docker image with CI

Make local changes and commit

```
(base) engin@engin-Latitude-7300:~/pytorchjob$ git push origin test
Counting objects: 3, done.
Delta compression using up to 8 threads.
Compressing objects: 100% (3/3), done.
Writing objects: 100% (3/3), 519 bytes | 519.00 KiB/s, done.
Total 3 (delta 2), reused 0 (delta 0)
remote:
remote: To create a merge request for test, visit:
remote:   https://gitlab.cern.ch/eneren/pytorchjob/-/merge_requests/new?merge_request%5Bsource_branch%5D=test
remote:
To ssh://gitlab.cern.ch:7999/eneren/pytorchjob.git
   a529157..a534f70  test -> test
(base) engin@engin-Latitude-7300:~/pytorchjob$
```



Engin Eren > Pytorchjob > Pipelines

All 9 Finished Branches Tags

Clear runner caches CI lint Run pipeline

Filter pipelines

Show Pipeline ID

Status	Pipeline	Triggerer	Stages
running In progress	removing multiprocessing approach #3790635 test -> a534f70b latest		
passed 00:04:15 14 hours ago	testing DDP_2 #3788308 test -> a5291576		
passed 00:04:32 14 hours ago	testing DDP #3788251 test -> de13a041		

Engin Eren > Pytorchjob

✔ You pushed to test at Engin Eren / Pytorchjob 48 minutes ago

Create merge request

P

Pytorchjob

Project ID: 132781

49 Commits

2 Branches

0 Tags

297 KB Files

699 KB Storage

master

pytorchjob /

+

Merge branch 'eneren-master-patch-57749' into 'master'
Engin Eren authored 23 hours ago

Distributed training: Submit training job in terminal

\$ root@pytorch-dist-regressor- X

\$ Terminal 5 X

```
@model-testing-cpu-0:~/pytorchjob$ kubectl apply -f pytorch_job_regressor_nccl.yaml
pytorchjob.kubeflow.org/pytorch-dist-regressor-samlerv2-testnccl created
@model-testing-cpu-0:~/pytorchjob$ kubectl get pods
```

pytorch-dist-regressor-samlerv2-nccl-master-0	1/1	Running	0	55m
pytorch-dist-regressor-samlerv2-nccl-worker-0	1/1	Running	0	55m

```
@model-testing-cpu-0:~/pytorchjob$ kubectl logs pytorch-dist-regressor-samlerv2-nccl-master-0
whoami: 0
beginning of python script
True
Using CUDA
Using distributed PyTorch with nccl backend
[init] == local rank: 0, global rank: 0, world size: 2 ==
loading data
init models
starting training...
Energy Regressor --> Train Epoch: 1 [0/74999 (0%)]      loss=2513.1494
Energy Regressor --> Train Epoch: 1 [5000/74999 (13%)]   loss=1959.6224
Energy Regressor --> Train Epoch: 1 [10000/74999 (27%)]  loss=1403.6118
Energy Regressor --> Train Epoch: 1 [15000/74999 (40%)]  loss=864.0803
Energy Regressor --> Train Epoch: 1 [20000/74999 (53%)]  loss=663.8013
Energy Regressor --> Train Epoch: 1 [25000/74999 (67%)]  loss=431.6797
Energy Regressor --> Train Epoch: 1 [30000/74999 (80%)]  loss=327.7393
Energy Regressor --> Train Epoch: 1 [35000/74999 (93%)]  loss=14.7760
Energy Regressor --> Test Epoch: 1 [0/2999 (0%)]         loss=16.1639
[W pthreadpool-cpp.cc:90] Warning: Leaking Caffe2 thread-pool after fork. (function pthreadpool)
Energy Regressor --> Train Epoch: 2 [0/74999 (0%)]      loss=32.3057
@model-testing-cpu-0:~/pytorchjob$
```

Thank you