

## Munich/KIT approach

- **Neural network**  
multilayer perceptron
- **Input:** reconstructed cluster variables  
(width, total charge, ...)
- **Six NN** in parallel
  - for PXD layer 1,2
  - for 1,2,3+-pixel cluster
- **DAQ** aspects:
  - requires clustering on DHH
  - requires remapping on DHH
  - PXD raw data format would change for rescued clusters (requires rewriting unpacker/decoder)
  - NN would run on DHH (or new PCIe hardware)

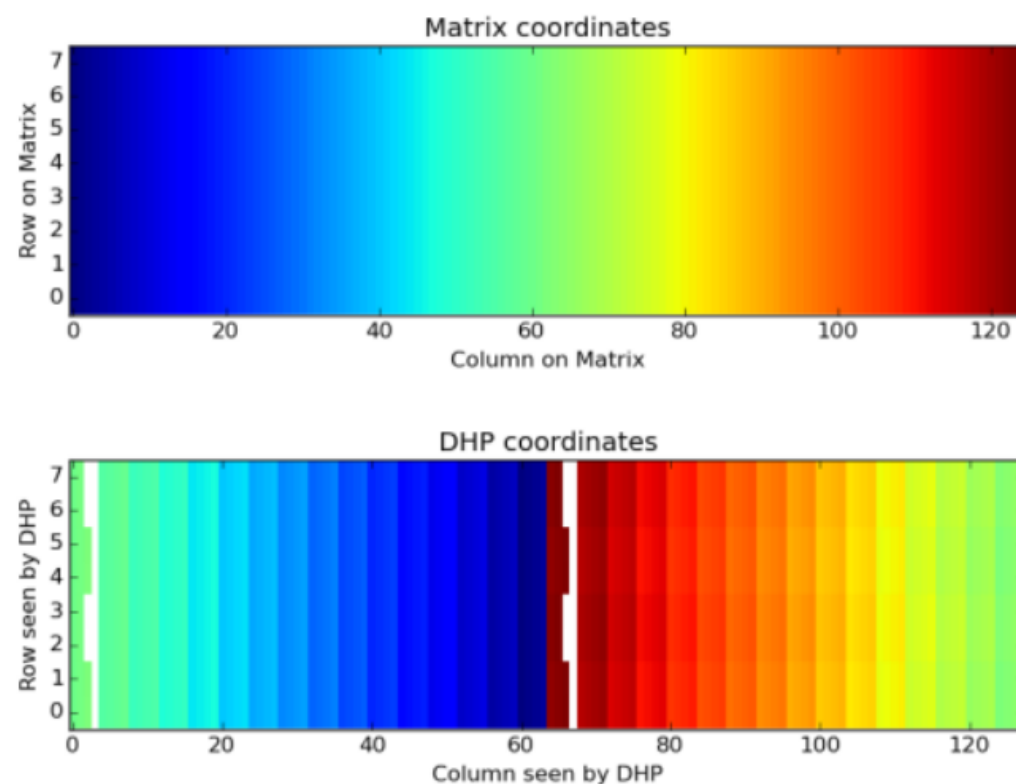
## Giessen approach

- **Neural network**
  - multilayer perceptron for image recognition e.g. convolution
  - tests of other algorithms
- **Input:**  
9x9 pixel matrix as image, grayscale (ADC values)
- **One NN** for everything
- **DAQ** aspects:
  - no clustering required
  - remapping on Onsen (as before)
  - no change of PXD raw data format
  - NN would run on Onsen (sliding 9x9 window)

# BACKUP

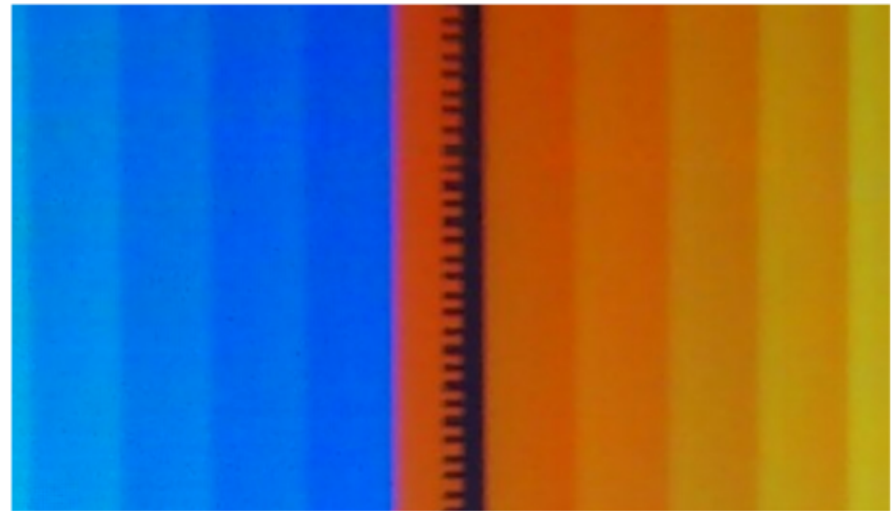
# ONSEN firmware: remapping

- introduced for PXD9 (1<sup>st</sup> time required in TB 04/2016)
- mirrored per 4 columns
- then mirrored per 64 columns
- 250 vs. 256 pixels
- different for PXD layer 1 and layer 2



# ONSEN firmware: remapping

- implemented in basf2 unpacker (offline) in TB 04/2016
- implemented on ONSEN (online) in TB 02/2017  
exact lookup tables on FPGA  
(no approximation)  
running stable in complete TB



There is one row alternating  
in DHP ID row-by-row