SVD Software-Hardware mapping

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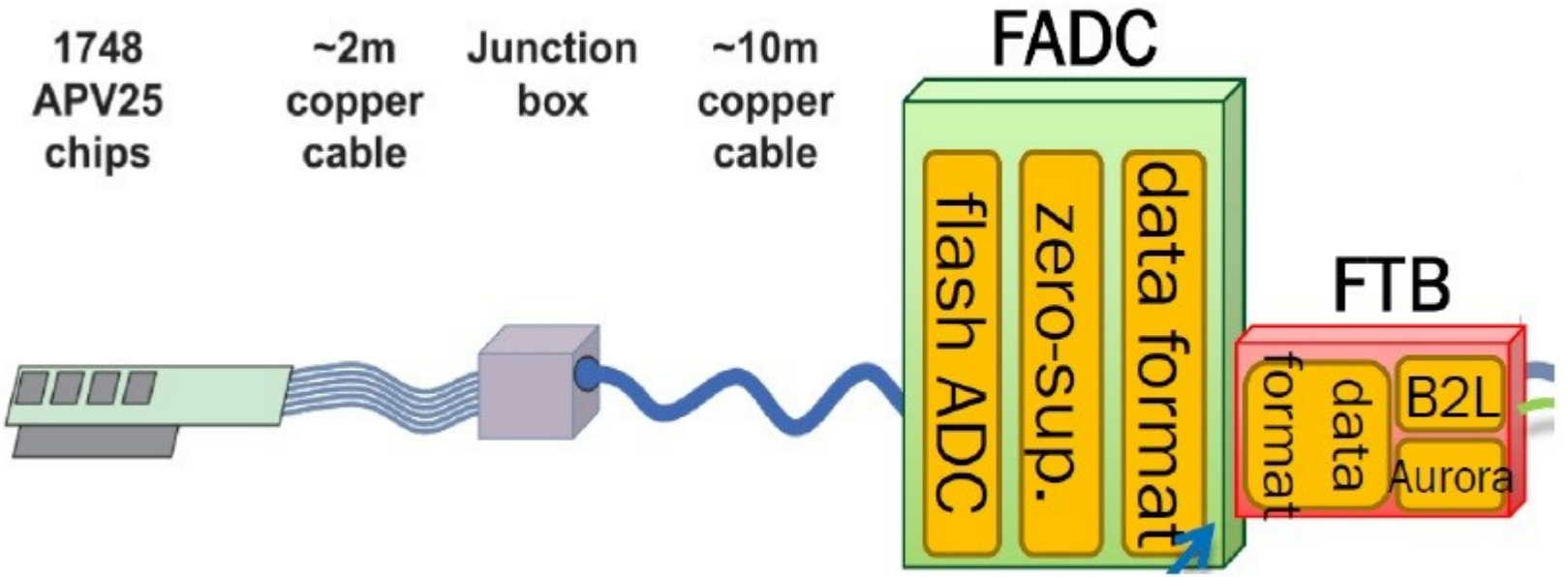
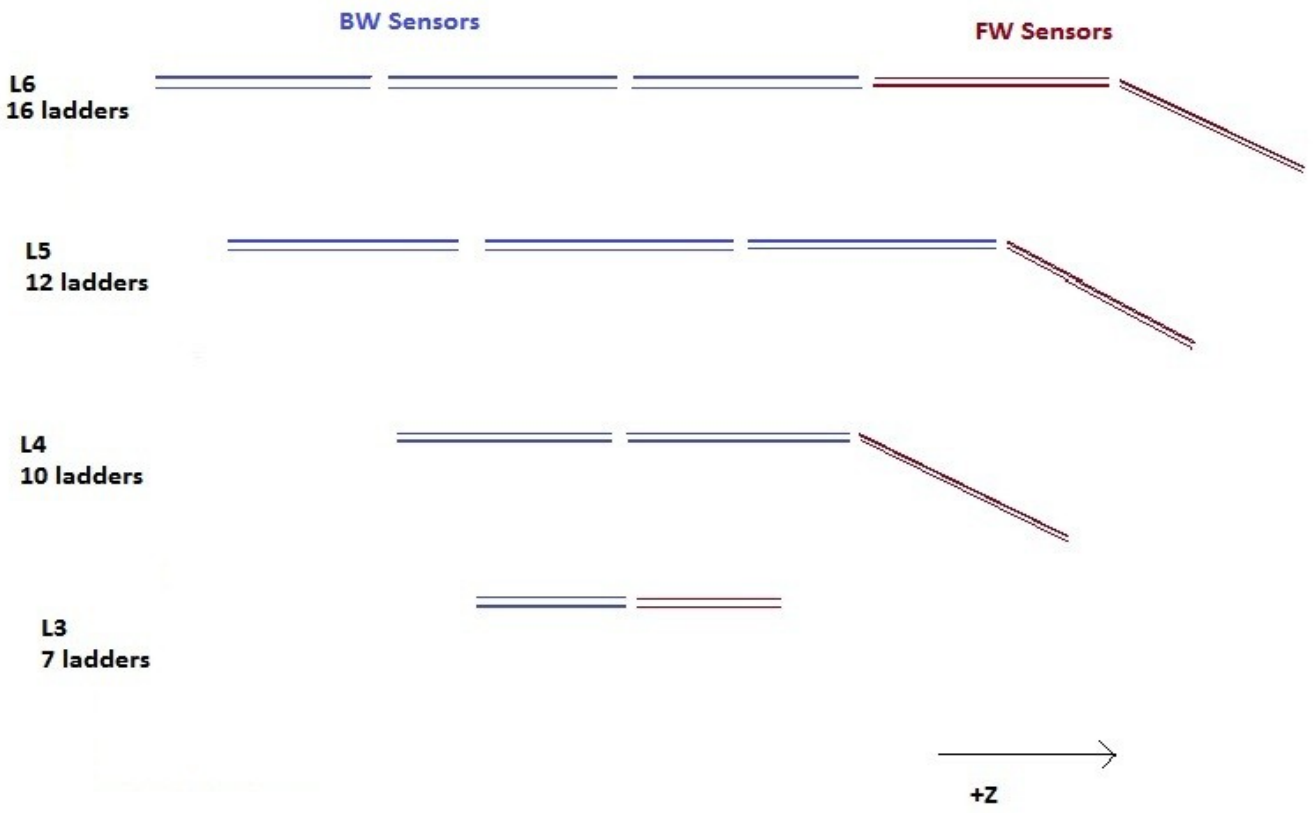
Goal..??

To prepare an xml file representing the connections between DSSD strips, APVs, and FADCs for SVD



SVD General information



DSSDs	Type	No.of strips (p side)	No.of strips (n side)	No. of APVs per sensors (p side)	No. of APVs per sensors (n side)	
Large	HPK	768	512	6	4	
Trapezoidal	Micron	768	512	6	4	
Small	HPK	768	768	6	6	

Connection rules between FADCs and hybrids/ Origamis

- FADC → 1 Junction board → 8 hybrids/Origamis (at most)
- 1 hybrid/Origami reads out one side of a DSSD
- 1 FADC serves either p or n sides, but never both
- 1 FADC serves either FW or BW, but never both
- 1 FADC serves only hybrids in one layer
- 1 FADC serves either HPK or Micron, but never both

FADCs...

	Ladders	BW sensors (per ladder)	FW sensors (per ladder)	BW sensors (total)	FW sensors (total)	BW FADCs	FW FADCs
L3	7	1 (HPK)	1 (HPK)	7 (HPK)	7(HPK)	1	1
L4	10	2 (HPK)	1 (Micron)	20(HPK)	10(Micron)	3	2
L5	12	3 (HPK)	1 (Micron)	36(HPK)	12(Micron)	5	2
L6	16	3 (HPK)	2 (HPK,Micron)	48(HPK)	16(HPK) + 16 (Micron)	6	4
total				111	61	15	9

- 24 FADCs for each p- and n-side, **total 48 FADCs**.

APV and FADC address

- 1 FADC → 1 Junction board → 8 hybrids/ Origamis and 1 hybrid / Origami can have maximum 6 APVs.

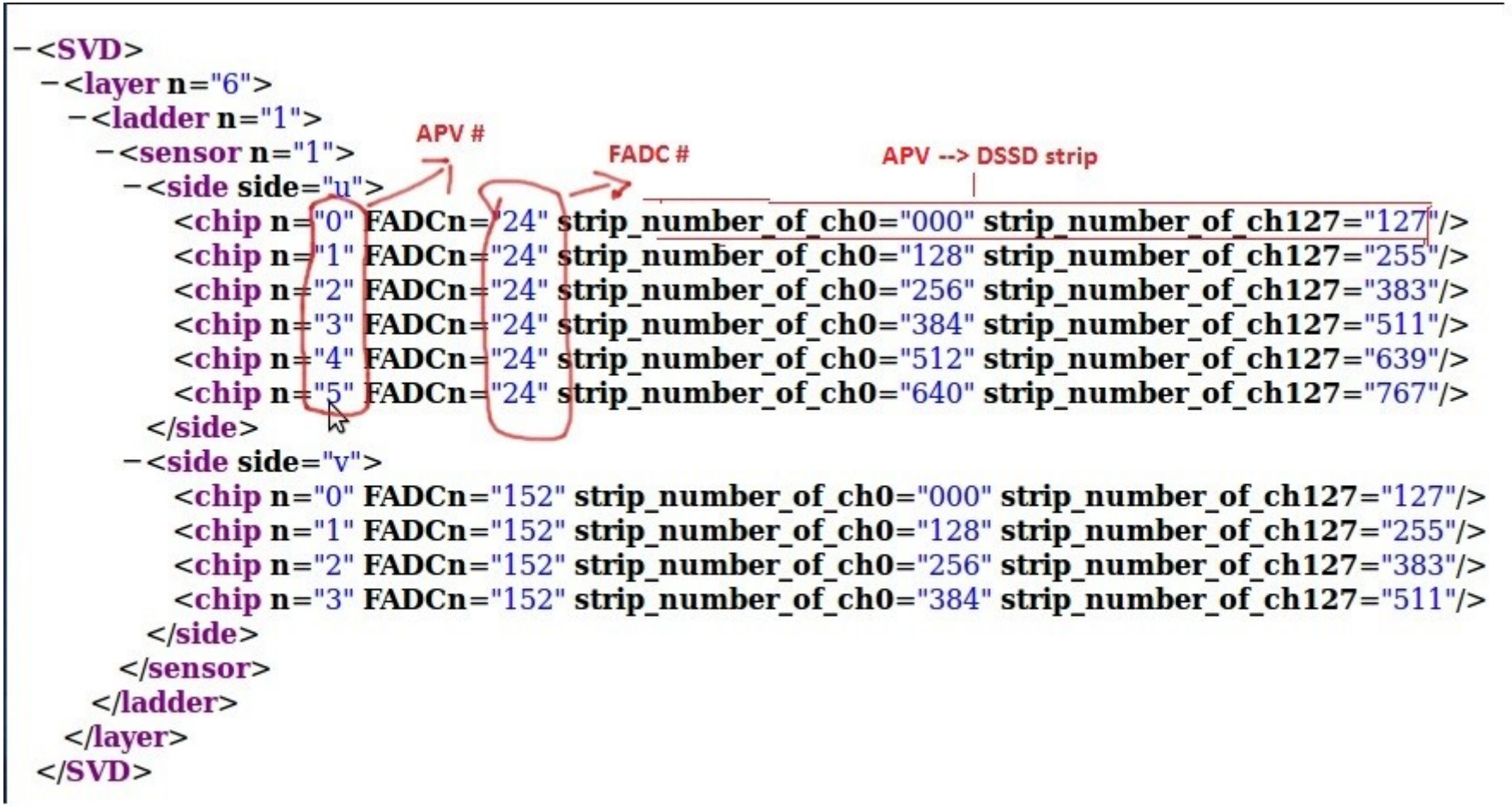
- So we can have APV numbers from **0 to 47**

- 8 bit FADC address

MSD							LSD
1 → n 0 → p	0	1 → BW 0 → FW	0 0 1 1	0 1 0 1	X	Y	Z

Filling xml file....

Example for L6, ladder 1, sensor 1




```
-<SVD>
  -<layer n="6">
    -<ladder n="1">
      -<sensor n="1">
        -<side side="u">
            <chip n="0" FADCn="24" strip_number_of_ch0="000" strip_number_of_ch127="127"/>
            <chip n="1" FADCn="24" strip_number_of_ch0="128" strip_number_of_ch127="255"/>
            <chip n="2" FADCn="24" strip_number_of_ch0="256" strip_number_of_ch127="383"/>
            <chip n="3" FADCn="24" strip_number_of_ch0="384" strip_number_of_ch127="511"/>
            <chip n="4" FADCn="24" strip_number_of_ch0="512" strip_number_of_ch127="639"/>
            <chip n="5" FADCn="24" strip_number_of_ch0="640" strip_number_of_ch127="767"/>
          </side>
        -<side side="v">
            <chip n="0" FADCn="152" strip_number_of_ch0="000" strip_number_of_ch127="127"/>
            <chip n="1" FADCn="152" strip_number_of_ch0="128" strip_number_of_ch127="255"/>
            <chip n="2" FADCn="152" strip_number_of_ch0="256" strip_number_of_ch127="383"/>
            <chip n="3" FADCn="152" strip_number_of_ch0="384" strip_number_of_ch127="511"/>
          </side>
        </sensor>
      </ladder>
    </layer>
  </SVD>
```

Preparation of Alignment Table

- To include more than 6 parameters per DSSDs

  (3 Translation + 3 Rotation + 2 Sagging...)

```
<Alignment>
   <Align component="6.1.1">

     <du unit="mm"> 0.000e+00</du> <dv unit="mm" > 0.000e+00</dv> <dw unit="mm"> 0.000e+00</dw>

     <alpha unit="deg"> 0.000e+00</alpha> <beta unit="deg">0.000e+00 </beta> <gamma unit="deg">0.000e+00 </gamma>

     <dx>0.000e+00</dx> <dy>0.000e+00</dy>

   </Align>
</Alignment>
```

- How to store the Sagging Parameters..???

Conclusion

- XML file representing the connections between DSSD strips, APVs, and FADCs are prepared for all the four layers with all the connection rules taken into consideration.
- Alignment informations including all the parameters should be stored.

Next..

- Plug into the data base..

Thank You...