RPC numbering scheme in O2

MT11

	OUT	IN	
MT 11 OUT 9	44	8	MT 11 IN 9
MT 11 OUT 8	43	7	MT 11 IN 8
MT 11 OUT 7	42	6	MT 11 IN 7
MT 11 OUT 6	41	5	MT 11 IN 6
MT 11 OUT 5	40	4	MT 11 IN 5
MT 11 OUT 4	39	3	MT 11 IN 4
MT 11 OUT 3	38	2	MT 11 IN 3
MT 11 OUT 2	37	1	MT 11 IN 2
MT 11 OUT 1	36	0	MT 11 IN 1

MT12

	OUT	IN	
MT 12 OUT 9	53	17	MT 12 IN 9
MT 12 OUT 8	52	16	MT 12 IN 8
MT 12 OUT 7	51	15	MT 12 IN 7
MT 12 OUT 6	50	14	MT 12 IN 6
MT 12 OUT 5	49	13	MT 12 IN 5
MT 12 OUT 4	48	12	MT 12 IN 4
MT 12 OUT 3	47	11	MT 12 IN 3
MT 12 OUT 2	46	10	MT 12 IN 2
MT 12 OUT 1	45	9	MT 12 IN 1

MT21

	OUT	IN	
MT 21 OUT 9	62	26	MT 21 IN 9
MT 21 OUT 8	61	25	MT 21 IN 8
MT 21 OUT 7	60	24	MT 21 IN 7
MT 21 OUT 6	59	23	MT 21 IN 6
MT 21 OUT 5	58	22	MT 21 IN 5
MT 21 OUT 4	57	21	MT 21 IN 4
MT 21 OUT 3	56	20	MT 21 IN 3
MT 21 OUT 2	55	19	MT 21 IN 2
MT 21 OUT 1	54	18	MT 21 IN 1

MT22

	OUT	IN	
MT 22 OUT 9	71	35	MT 11 IN 9
MT 22 OUT 8	70	34	MT 11 IN 8
MT 22 OUT 7	69	33	MT 11 IN 7
MT 22 OUT 6	68	32	MT 11 IN 6
MT 22 OUT 5	67	31	MT 11 IN 5
MT 22 OUT 4	66	30	MT 11 IN 4
MT 22 OUT 3	65	29	MT 11 IN 3
MT 22 OUT 2	64	28	MT 11 IN 2
MT 22 OUT 1	63	27	MT 11 IN 1

- IN and OUT can be accessed by a variable called “isRight” if true it’s inside, if false it’s outside
- How to get this values:
  - Enter O2 environment
  - Enter root and type:
    - #include "MIDBase/DetectorParameters.h"
    - cout << o2::mid::detparams::getDEId(isRight,plane,RPC) << endl
    - isRight: can be true or false. If true -> RPC is inside else the RPC is outside
    - plane goes from 0 to 3 and 0 → MT11, 1 → MT12, 2 → MT21, 3 → MT22
    - RPC goes from 0 to 8 and 0 is the bottom RPC and 8 is the top one in each plane

Local Board scheme

- Column numbering starts from the center of MID and goes outward
- Line numbering is different for each RPC depending on the segmentation
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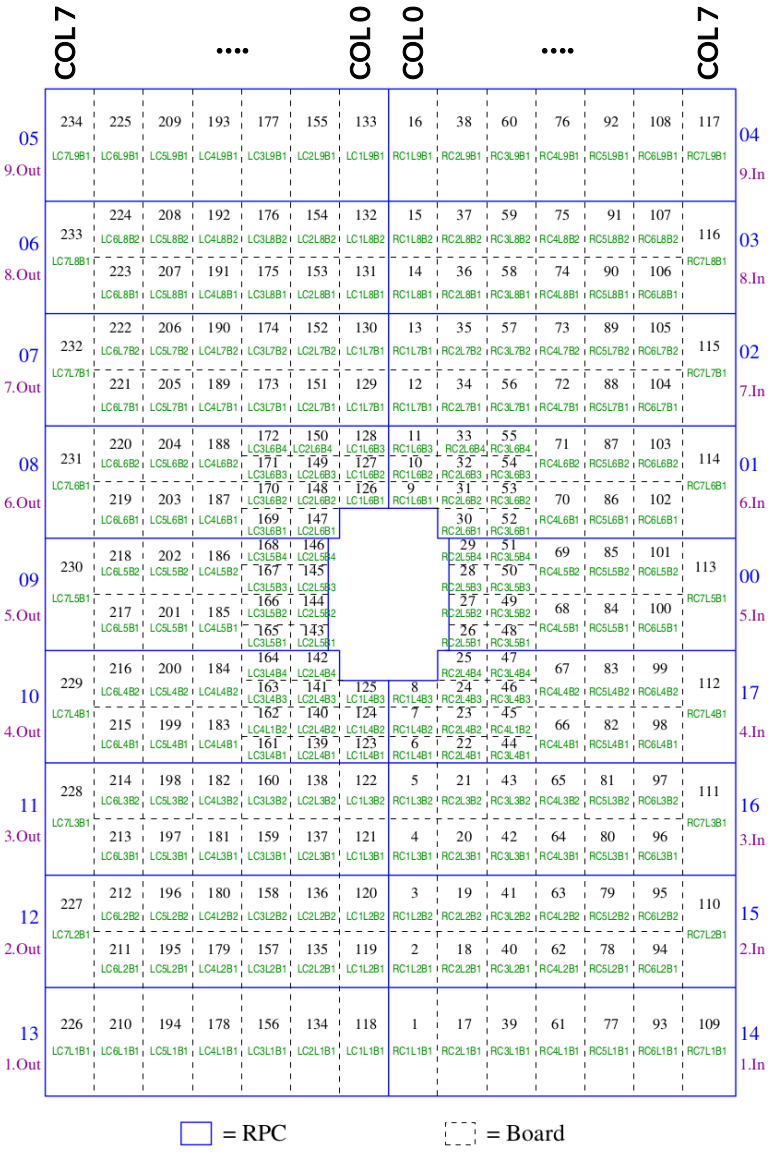
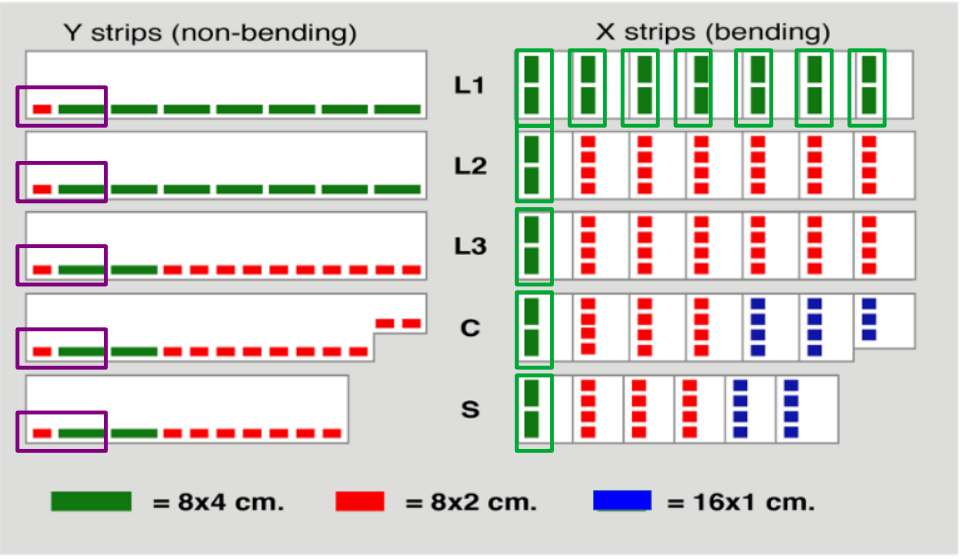
  - For example in RPC 1 in there is only one line (number 0) in all columns
  - In RPC 6 instead in column 0 we have 3 lines (0,1,2) and in column 1 we have 4 (0,1,2,3)
- Examples:
  - LB 67 → column 3, line 1
  - LB 9 → column 0, line 0
  - LB172 → column 2, line 3



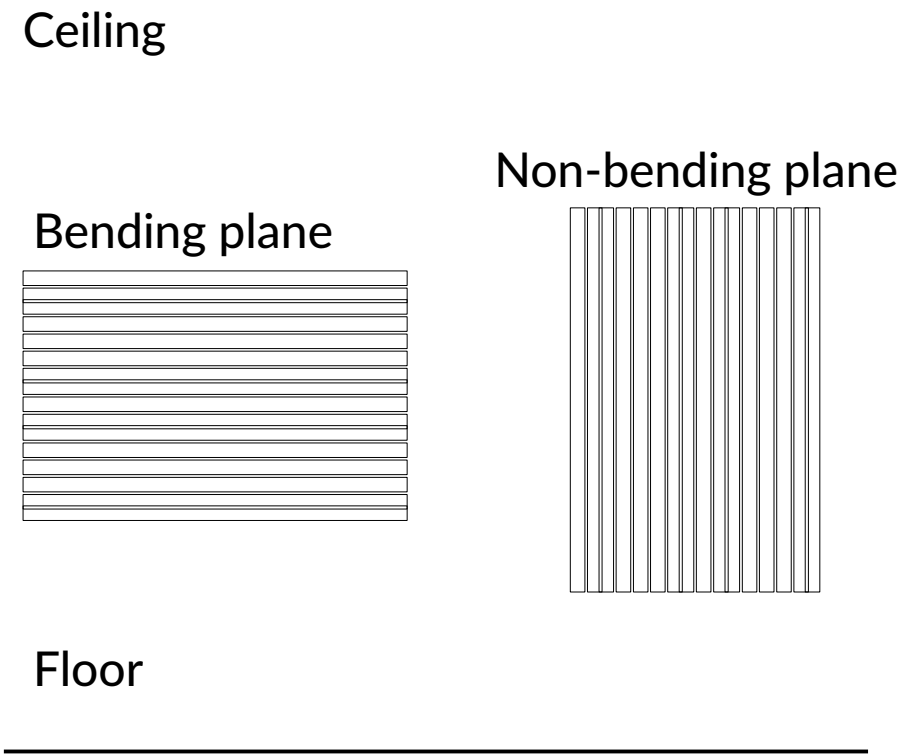
LB and strips

- If the strip pitch is 4 cm → a LB reads 8 strips
- If the strip pitch is 2 cm → a LB reads 16 strips
- If the strip pitch is 1 cm → a LB reads 16 strips
- Exception 1
  - One LB reads 8 strips with 4 cm pitch + 8 strips with 2 cm pitch
- Exception 2
  - One LB reads 16 strips with 2 cm pitch



Column data format

- Way in which the MID data is saved
- Stored in
  O2 >> DataFormats >> Detectors >> MUON >> MID include >> DataFormatsMID >> ColumnData.h
- What is important for us is the *pattern*
  - We also have to indicate the detector element, line and column
  - It is an std::array with 5 elements
  - Each element is a base 16 number (0x….)
  - The first four elements represent the bending plane strips from the bottom to the top
    - There are four elements because at most there are 4 lines (see slide 2). If in the specified detector element there are less than 4 lines, the absent lines are discarded
  - The last one the non-bending plane strips from left to right
    - If in the specified detector element there are only 8 strips one should be careful to set the values only for them



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11	33	MT11 IN 6 deId = 5
10	32	
9	31	
	30	

- LB 9 → column 0, line 0, 16 strips BP
- LB 10 → column 0, line 1, 16 strips BP
- LB 11 → column 0, line 2, 16 strips BP

- LB 30 → column 0, line 0, 16 strips BP
- LB 31 → column 0, line 1, 16 strips BP
- LB 32 → column 0, line 2, 16 strips BP
- LB 33 → column 0, line 3, 16 strips BP

- Same NBP pattern read by LBs 9,10,11
- Same NBP pattern read by LBs 30,31,32,33

- Example of pattern for LB 10 on BP:
  - 0x1FB0 → 0001 1111 1011 0000

Top strips Bottom strips