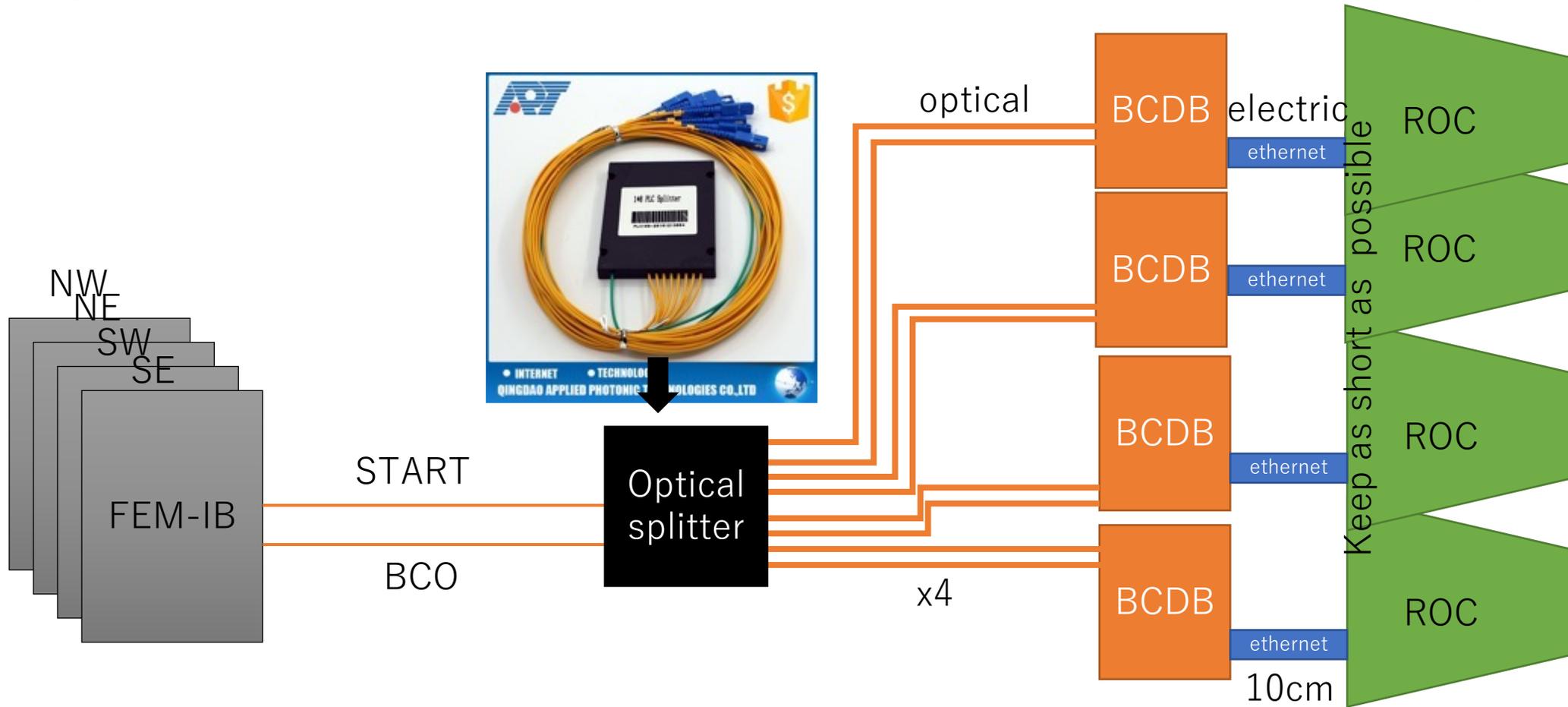


BCDB Proposal

RIKEN/RBRC

Itaru Nakagawa

Proposed Beam Clock Distribution Config.



Keep the electric section as short as possible.
Employ high class ethernet cables for the better noise shielding performance



Choice of Optical Splitter



- No power input.
- Simply fan out the copy of the input signal, but less intensity
- The output intensity will be $1/8$ for 8 channel optical splitter.

Our requirement is 4 channel fan out, so the intensity will be $1/4$. This may be not too bad and we can try. However, it is preferable to make BCLK copies without losing intensity.

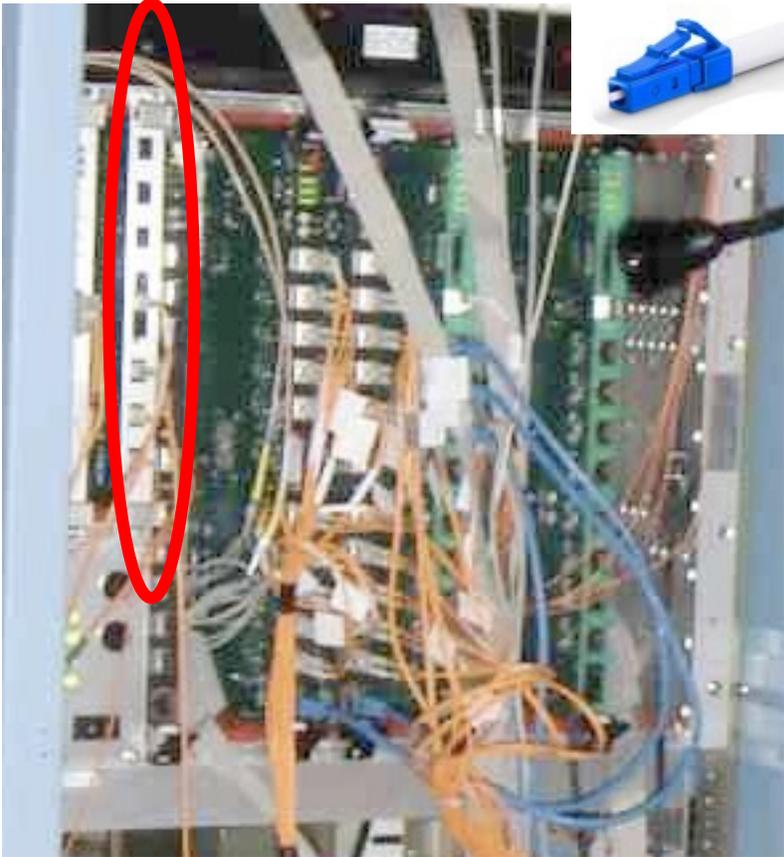
PHENIX Resources

PHNX-046B

- PECL
- LC-LC
- LC-LC
- LC-LC
- LC-LC
- ...



Input : SC
Output : SC x6



Beam Clock Fan Out Board
Used for the Muon Trigger



Duplex LC Fiber connector
vs
Simplex LC Fiber Connector

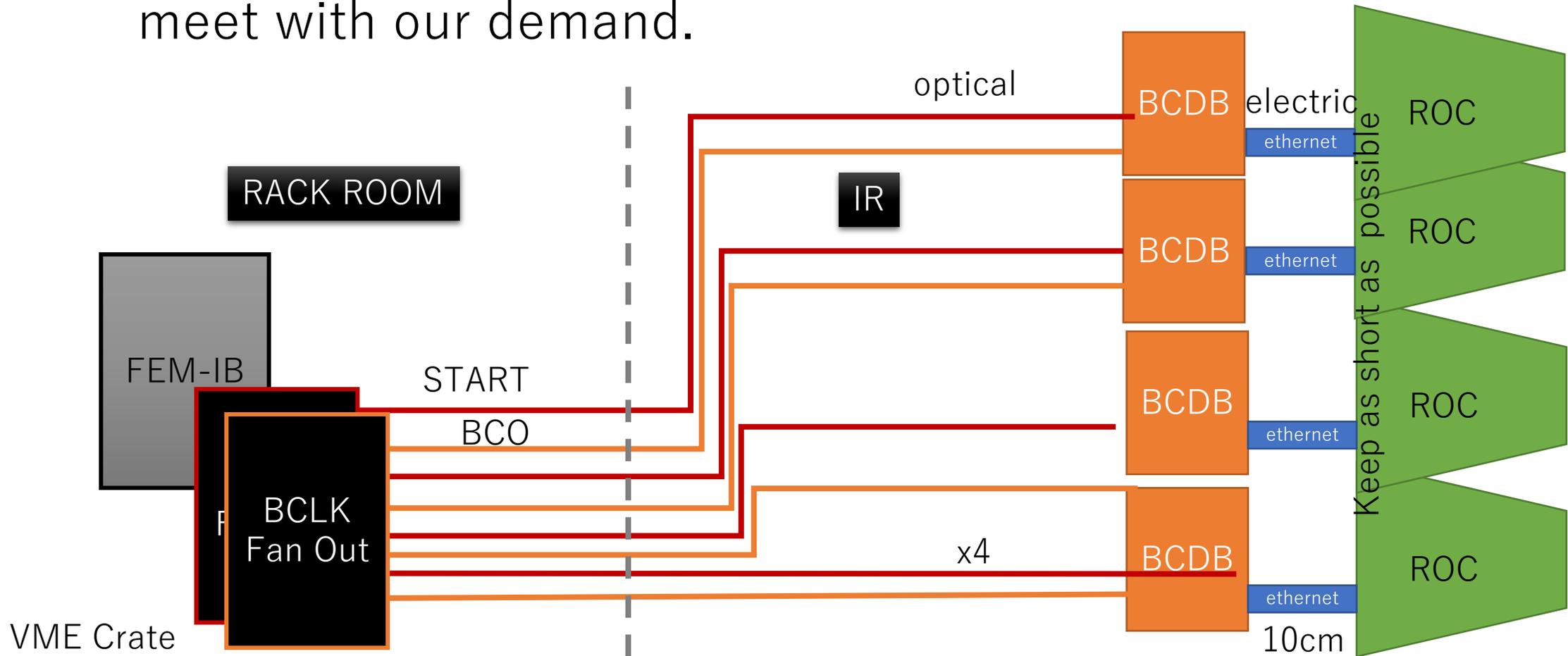


Duplex SC Fiber connector
vs
Simplex SC Fiber Connector

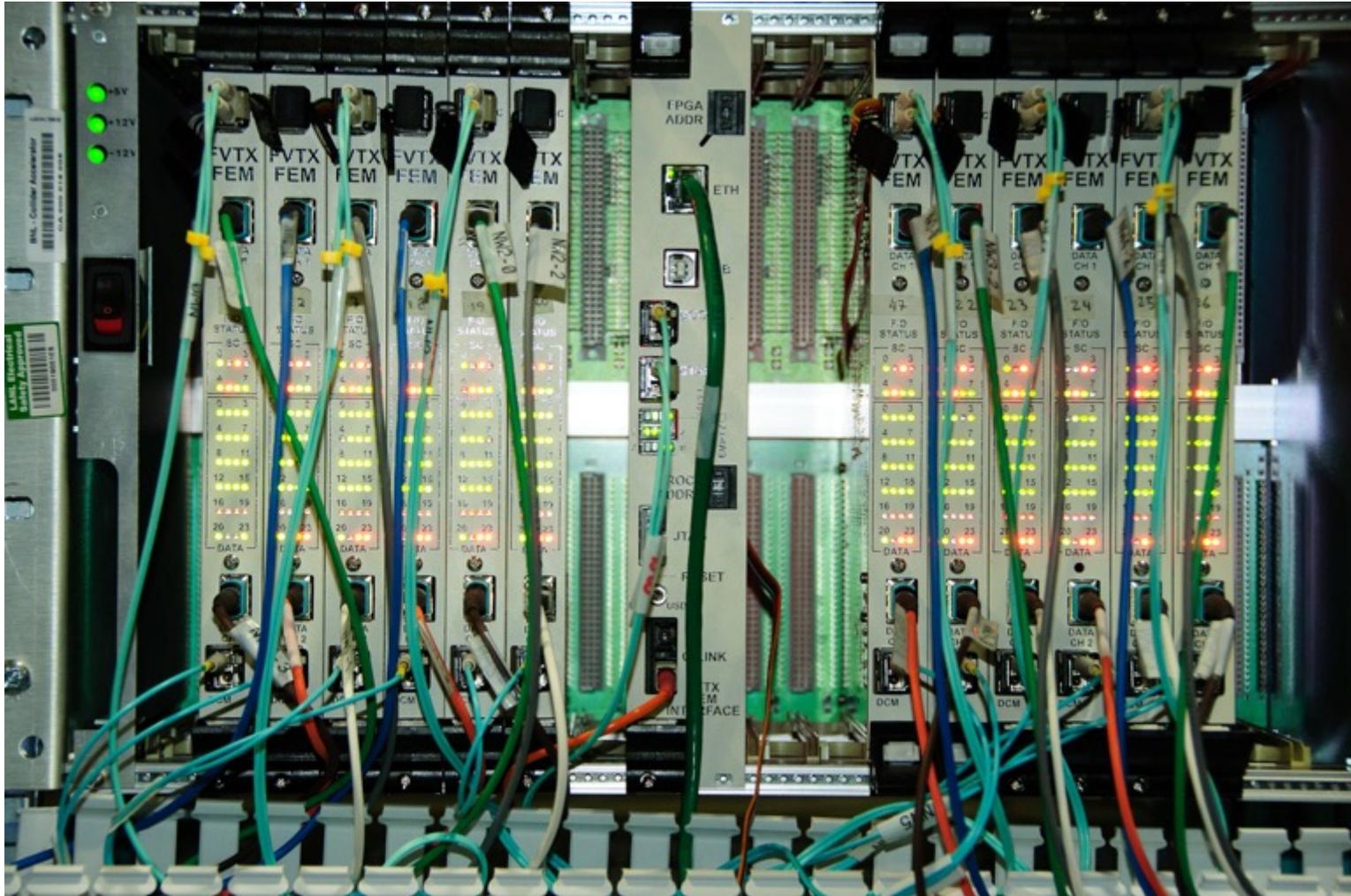


Strategy

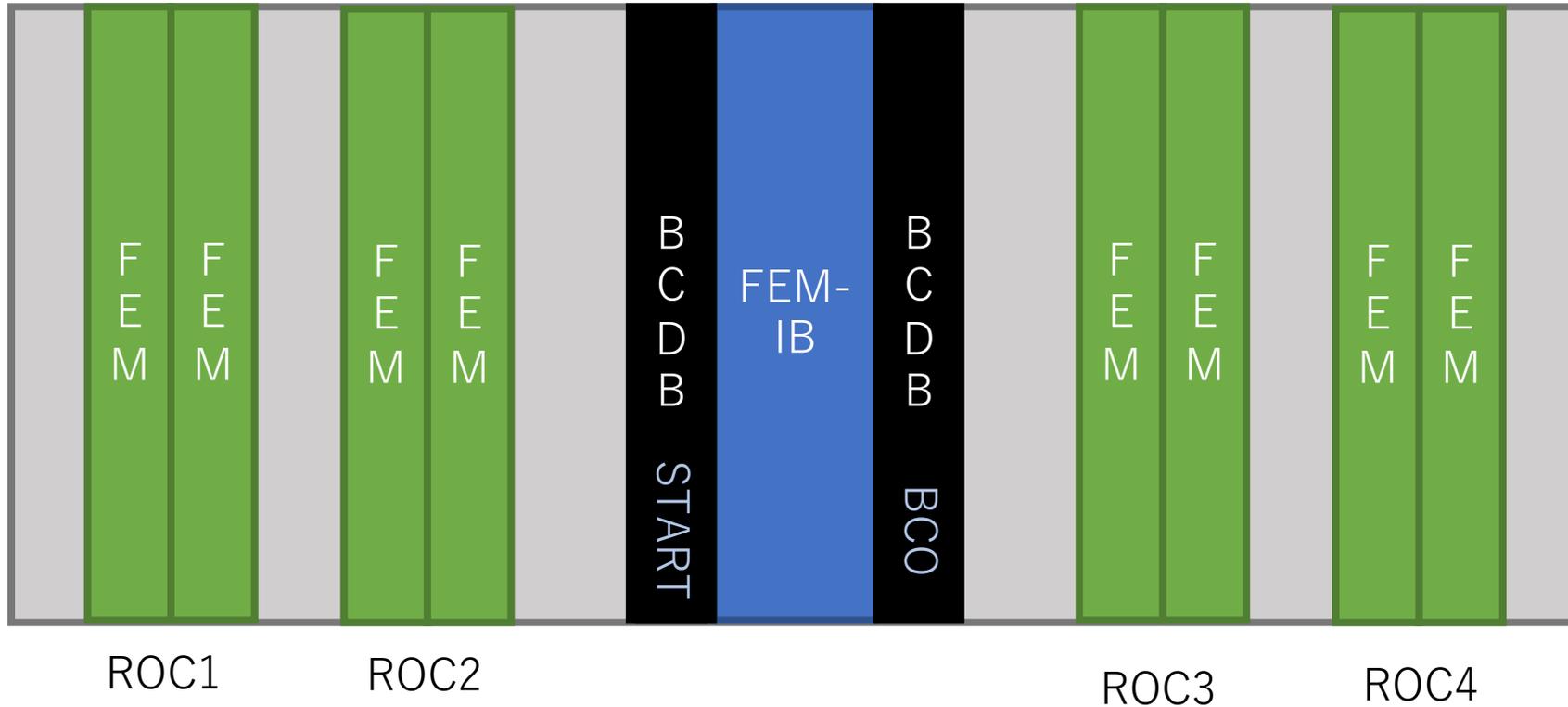
- Try a commercial optical splitter and see if it works even the light intensity becomes $1/4$.
- Possible redesign ex-PHENIX beam clock fan out board to meet with our demand.



Run12 FVTX Crate Setup



VME Crate Configuration



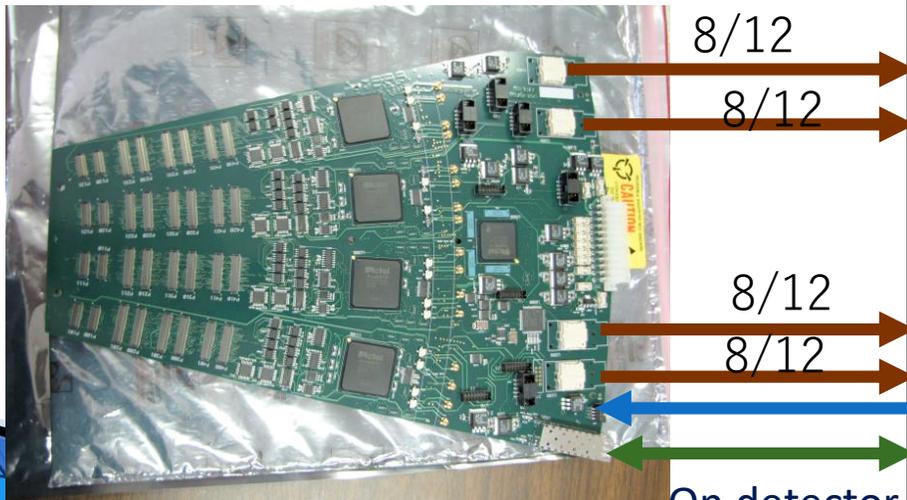
Same for
NW, NE, SW, SE

FELIX Configuration

INTT FEM → FELIX

- ▶ Signals between ROC and FELIX/FEM
 - ROC->FELIX data: 4x8 TLK->HFBR-772BEZ MPO fibers
 - FELIX <> ROC slow control: 1 bidirectional SFP
 - FELIX -> ROC timing: 2x fibers with CLK/START signal
- ▶ Total 16 ROCs & FELIXs.

Data : 4x8=32ch
 Slow Control=2ch
 BCO&Start : 2x2=4Ch
 Total = 38ch



On detector Counting house

Jin Huang <jhuang@bnl.gov>

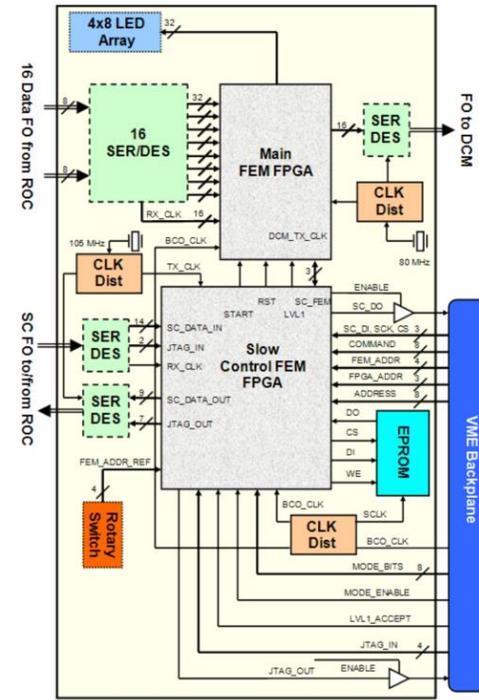


Figure 10: (color online) Block diagram of a FEM board.



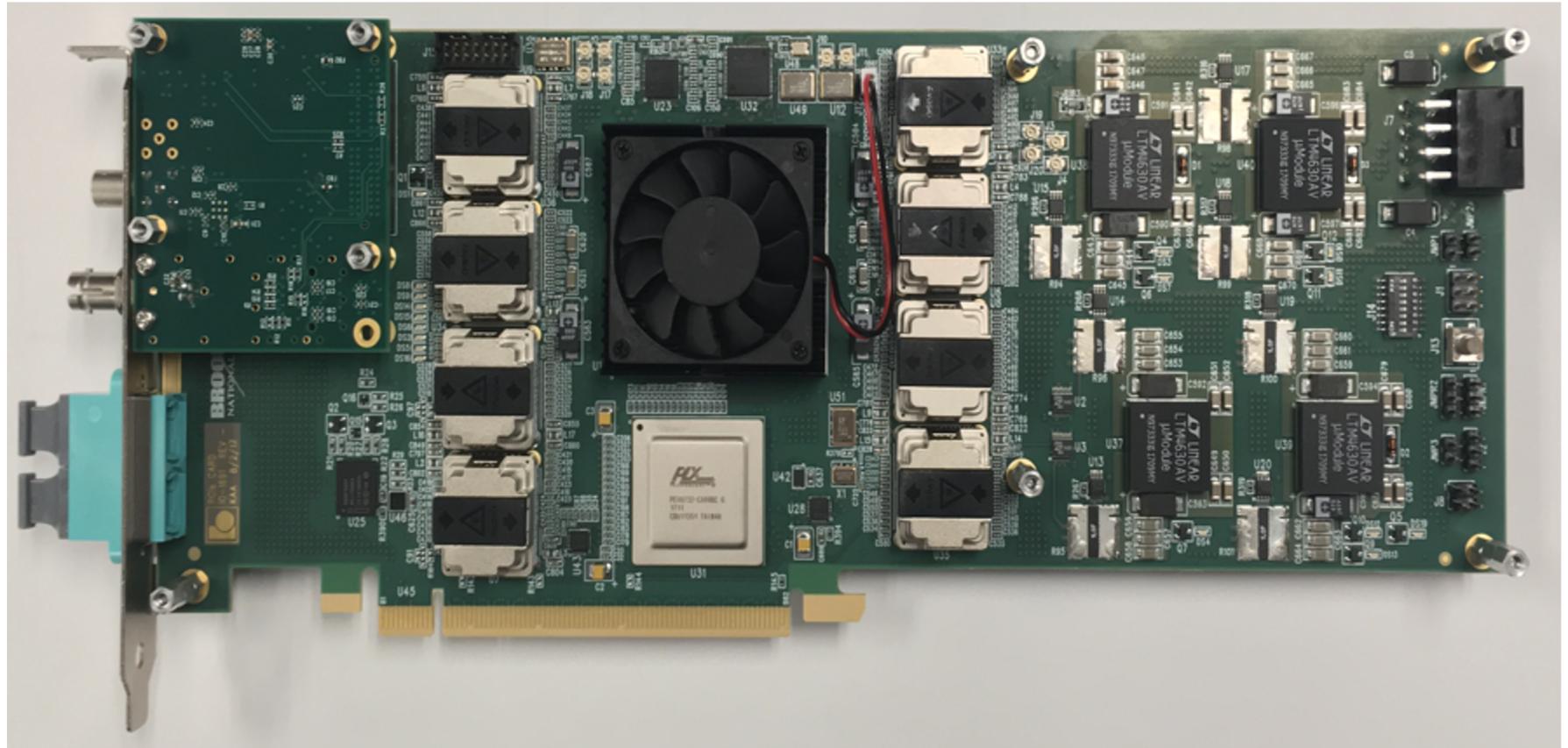
48ch

Each FELIX support 48 bi-directional SFP+ link (1 used for timing). Can work with lower speed FVTX SFP too



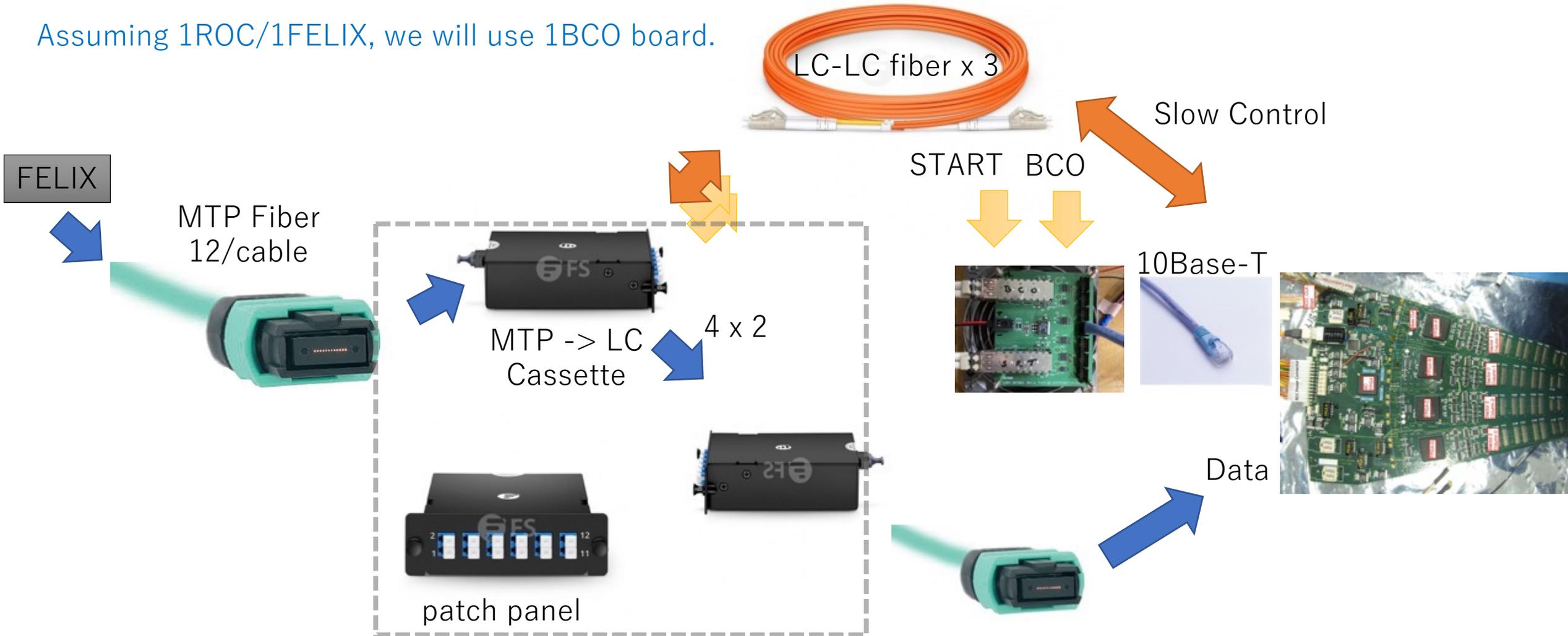
Compatibility with FELIX?

MTP Fiber
12/cable



FELIX-ROC Communication

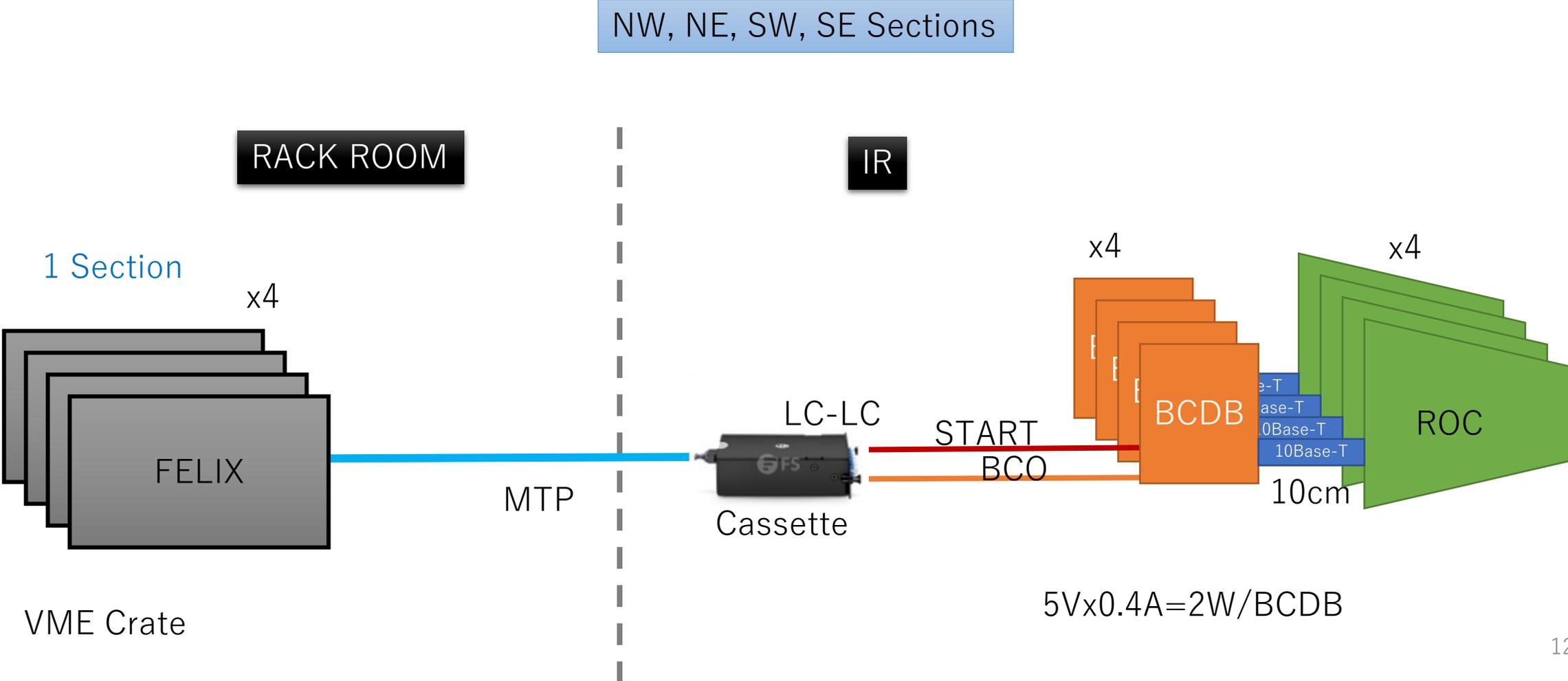
Assuming 1ROC/1FELIX, we will use 1BCO board.



I am in communication with Sioan Zohar. (He may have different design.)

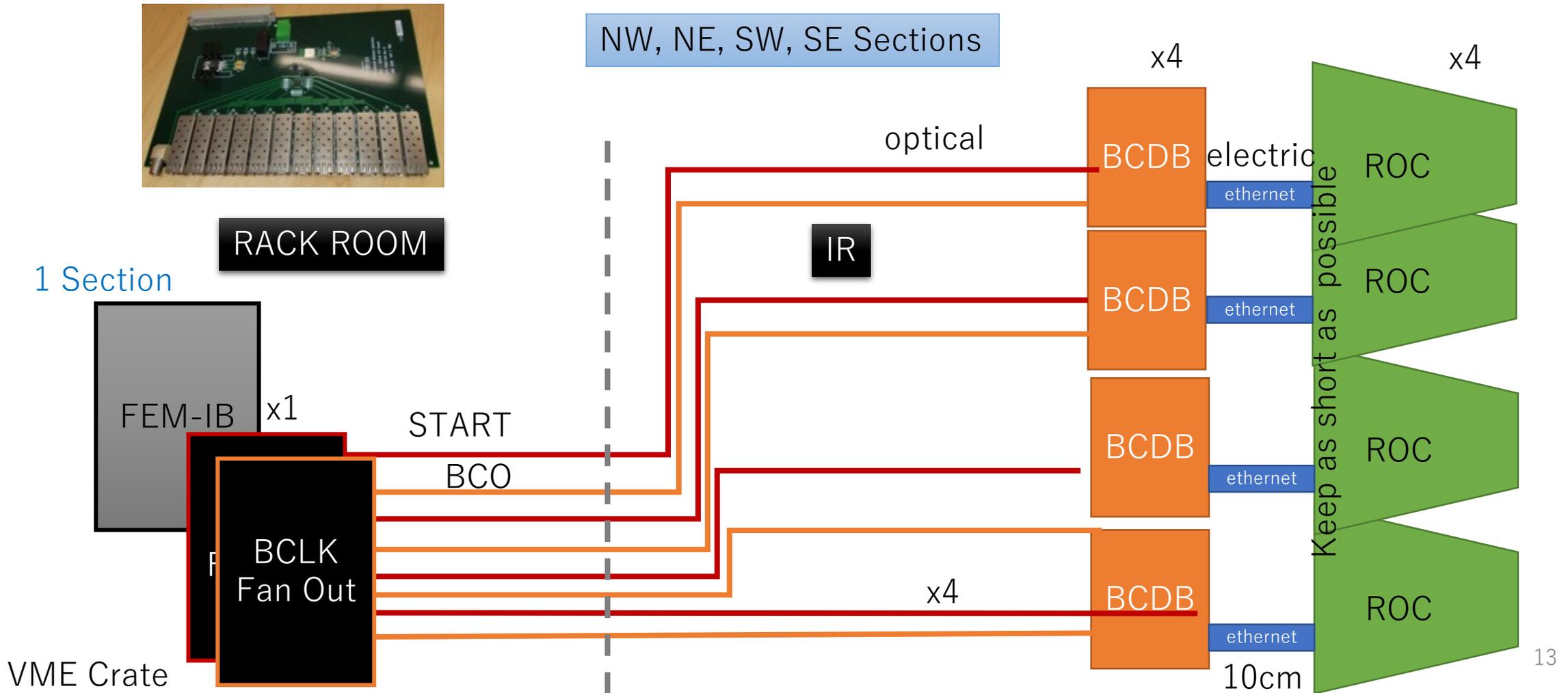
FELIX BCLK Configuration

- Assuming 1 FELIX is assigned to each ROC.



FEM-IB Solution

- Redesign ex-PHENIX beam clock fan out board to change the input from PECL to LC-LC.



FEM-IB vs FELIX Scenario

	BCLK Fan Out	Cassettes	BCDB	10Base-T
FEM-IB	8	N/A	16	16
FELIX	N/A	32	16	16



Common



Next Step

- We can start making action for the common parts of BCLK distribution system between FEM-IB and FELIX.
- BCDB is waiting for a quote from ARS co. Start simplification in the design (possibly with ARS) and proceed to prototyping.
- Steve Boose@BNL offers modification of the BCLK Fanout Board and fabrication by his group. However, pessimistic in the timing. Perhaps one prototype for December beam test.
- FELIX Solution won't happen until Sioan convinces us the readiness of FELIX solution (this Winter?)