General Overview of the RF Synchronization Types of REFM Boxes.

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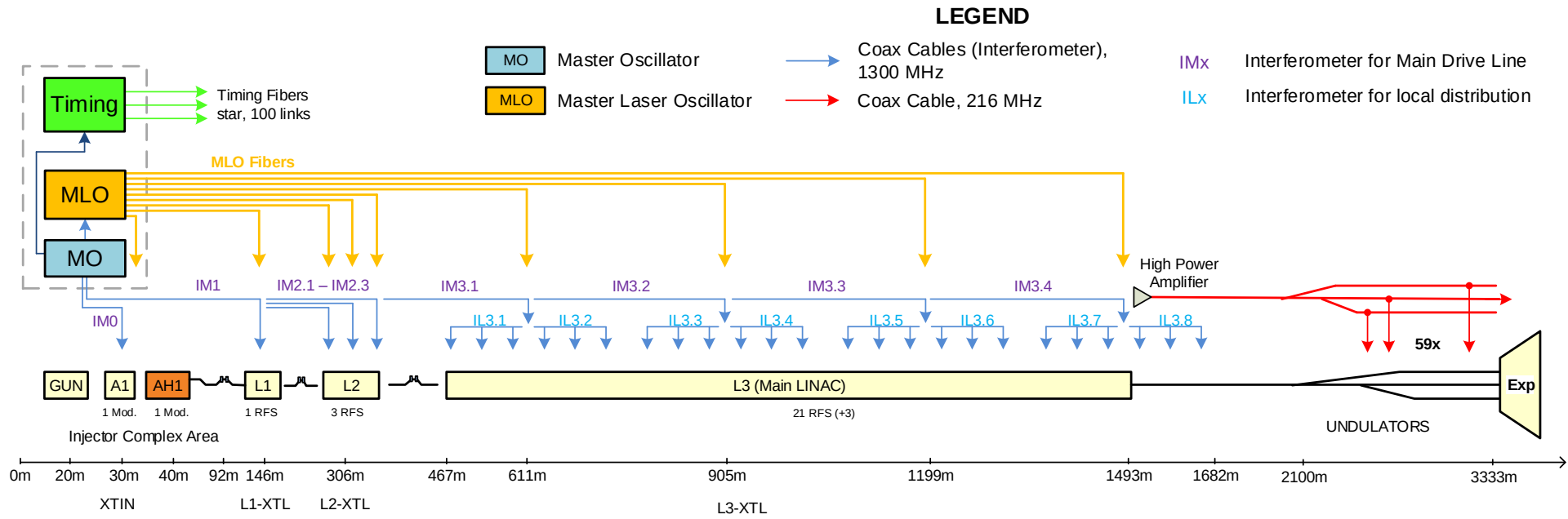
HELMHOLTZ ASSOCIATION

ISE

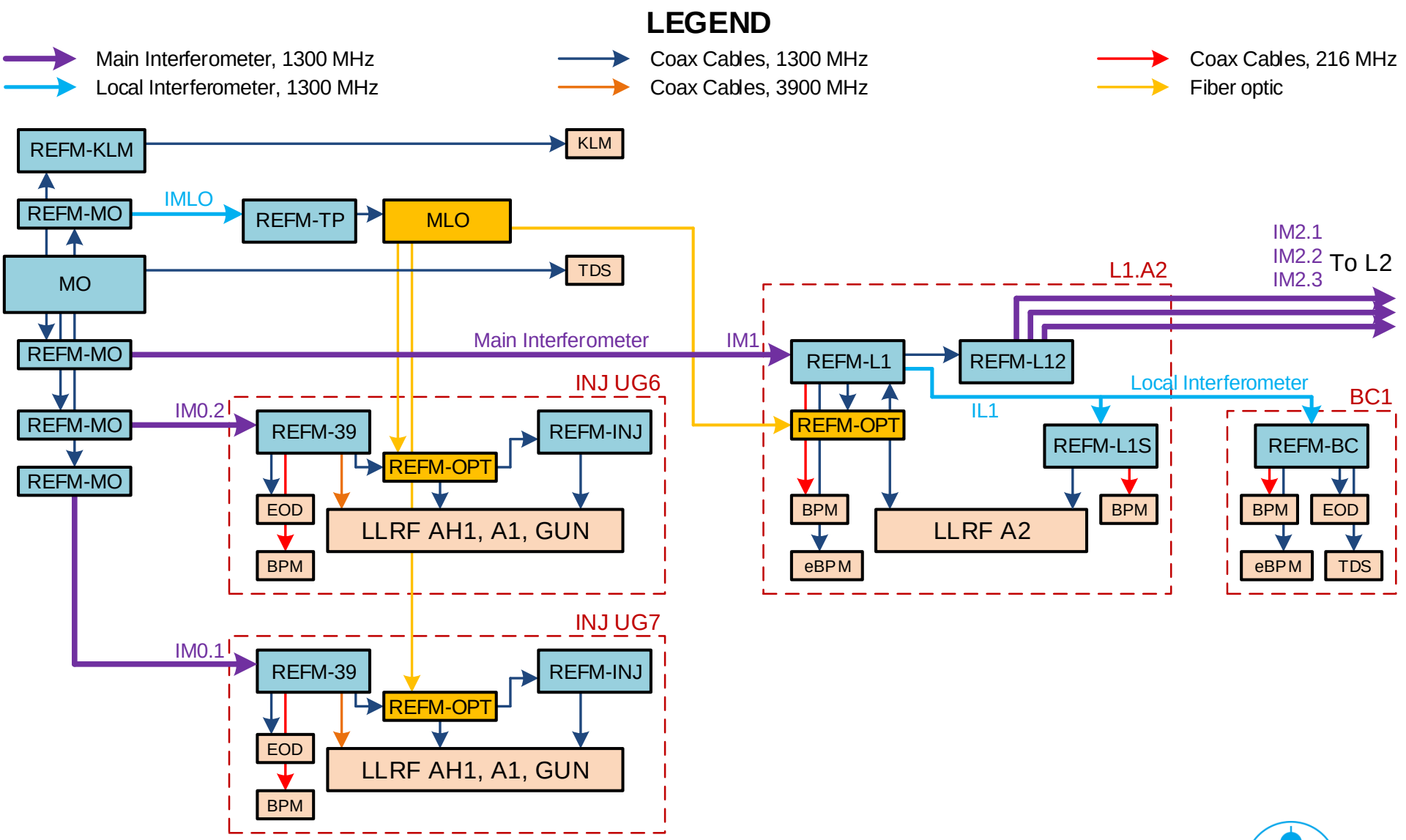
DESY

General Overview.

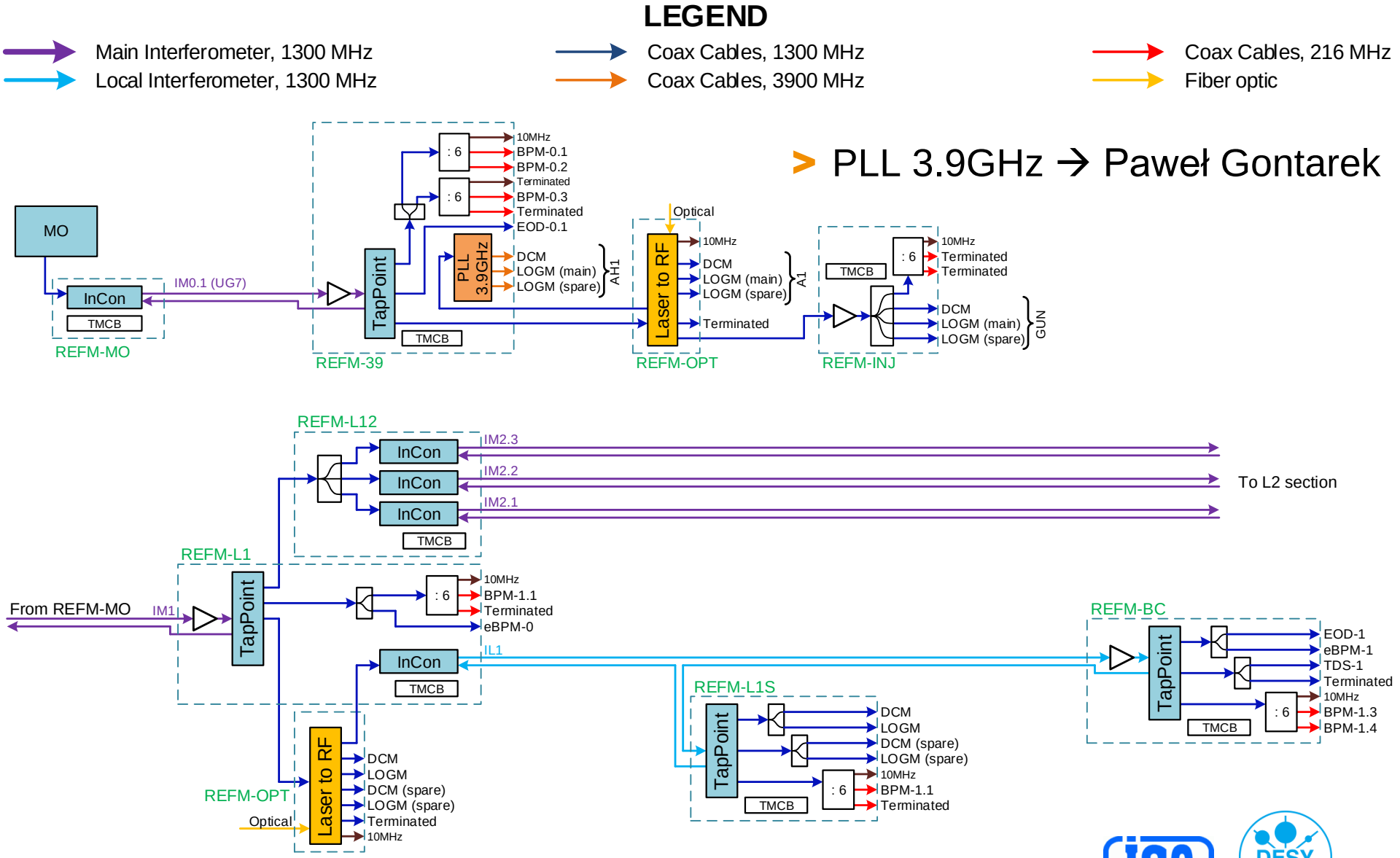


- 44 interferometer links in total (10 main and 34 local) – links number caused by power loss in interferometers
- ~263 reference outputs
  - 122 for LLRF (DCM, LOGM, uLOG)
  - 122 for BPM
  - 19 for Lasers, Special Diagnostics, Timing and KLM

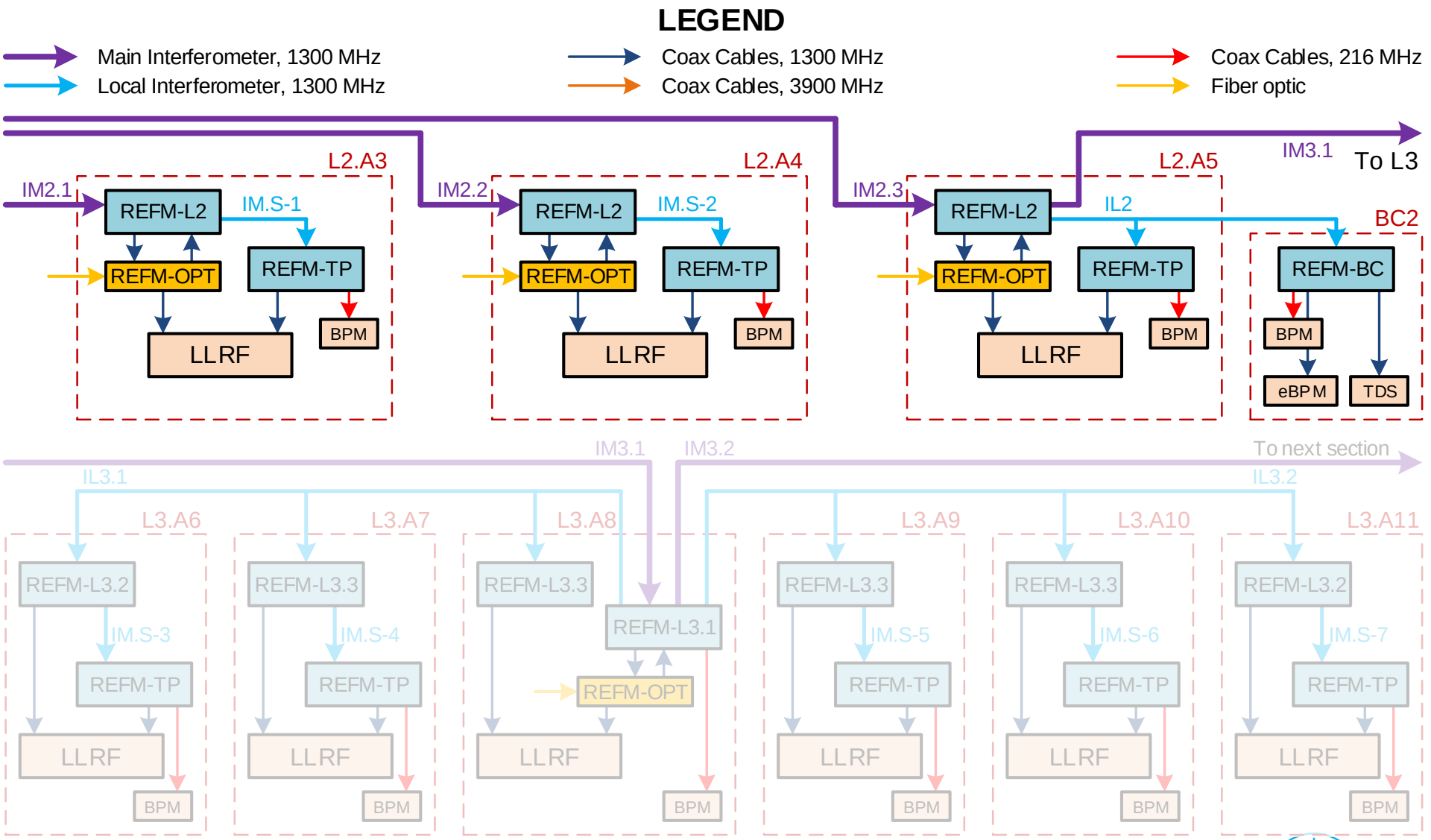
REFM Block Diagram Overview – INJ, L1.



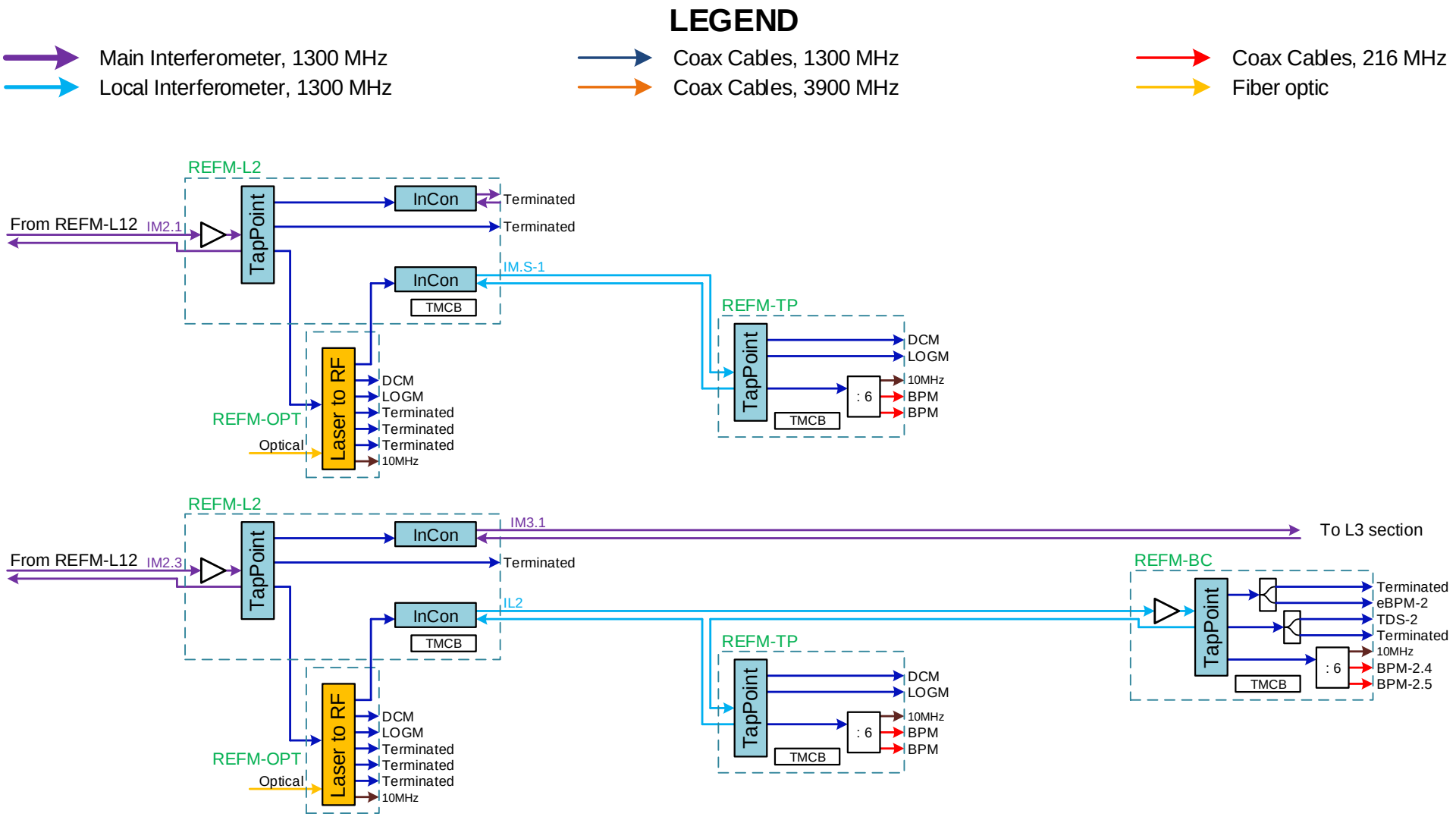
Detailed Block Diagram Overview – INJ, L1.



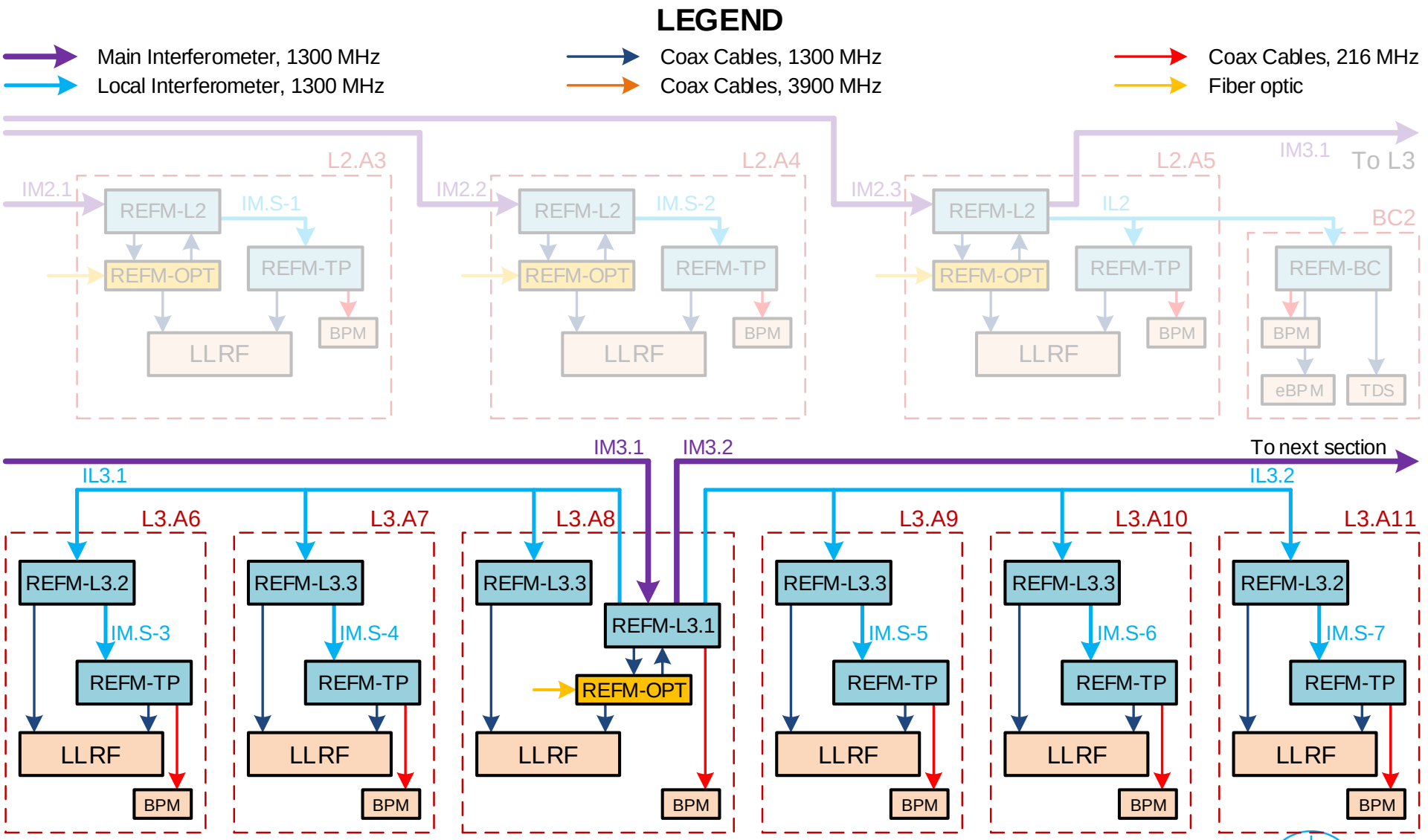
REFM Block Diagram Overview – L2, L3.



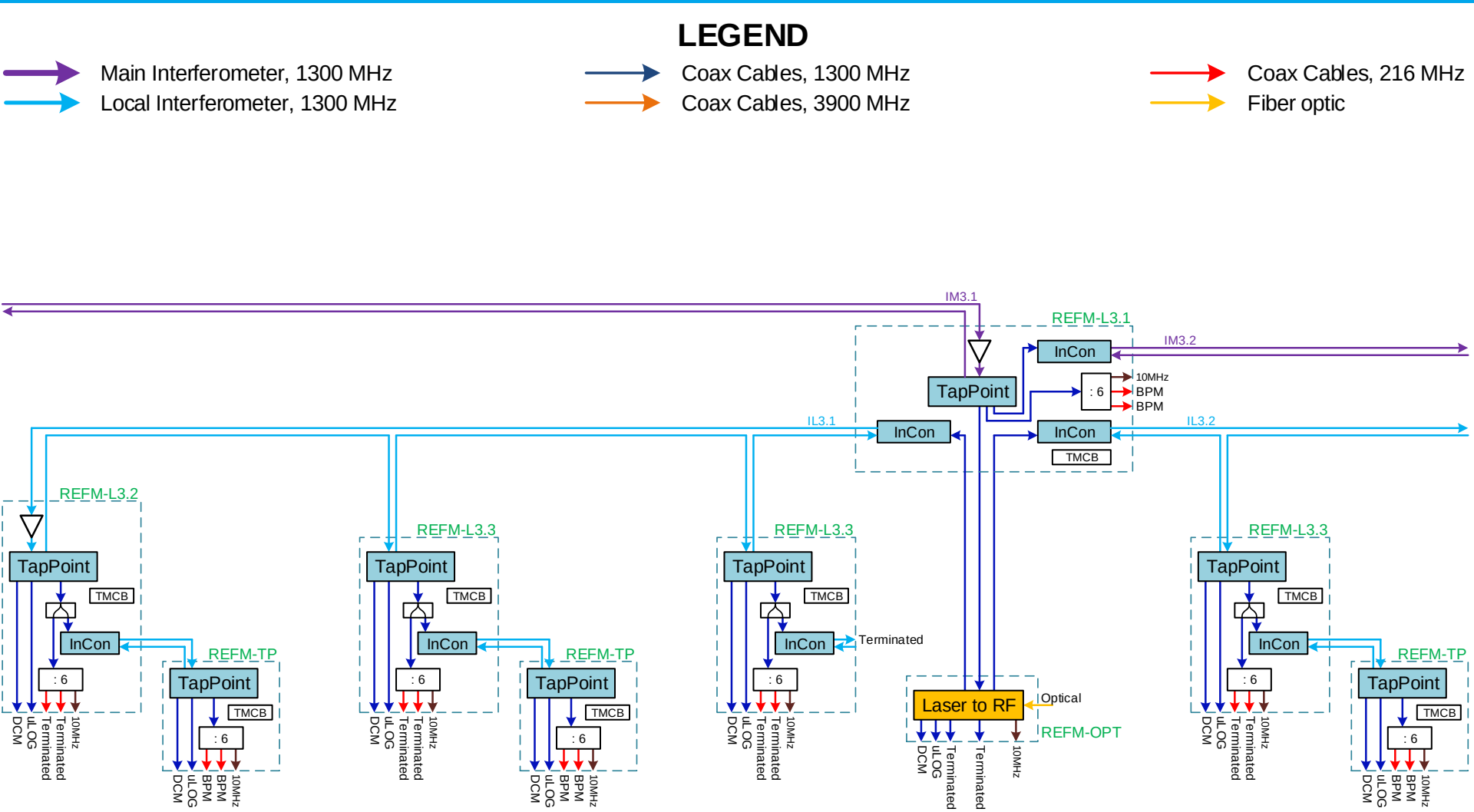
Detailed Block Diagram Overview – L2.



REFM Block Diagram Overview – L2, L3.



Detailed Block Diagram Overview – L3.



REFM Boxes – List.

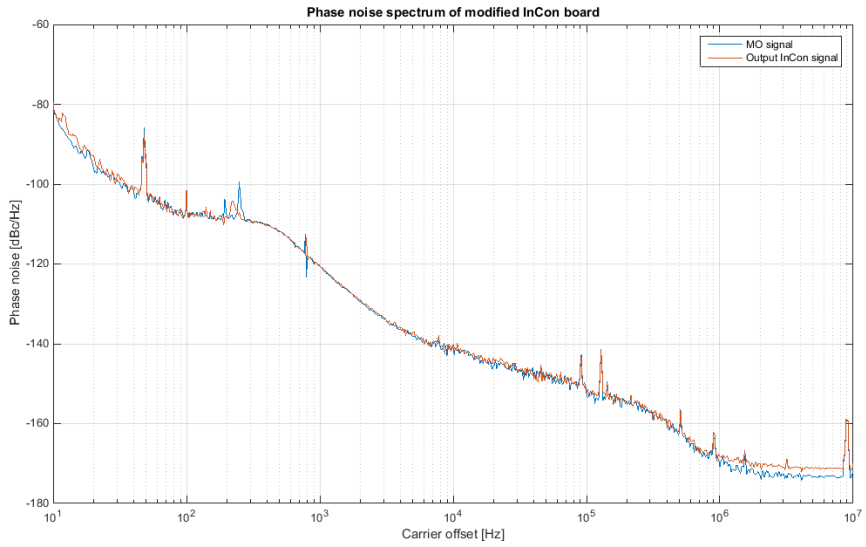
REFM Designator	REFM quantity	Component quantity per module									
		InCon	TapPoint	Phase shifter	Freq. divider	TMCB	FRED	Power splitter	Power amplifier	Power supply	PLL 3.9GHz
REFM-KLM	1					1	1	1	1		
REFM-MO	12	1				1	1				
REFM-TP	26		1	1	1	1	1				
REFM-INJ	2		1		1	1	1				
REFM-39	2		1	1	2	1	1	1			1
REFM-L1	1	1	1	1	1	1	1	1			
REFM-L1S	1		1	1	1	1	1	2			
REFM-L12	1	3				1	1	1			
REFM-BC	2		1	1	1	1	1	2		1	
REFM-L2	3	2	1	1		1	1				
REFM-L3.1	4	3	1	1	1	1	1				
REFM-L3.2	8	1	1	1	1	1	1	1			
REFM-L3.3	16	1	1	1	1	1	1	1			
REFM-BPM.0	1				1	1	1		1	1	
REFM-BPM.x	3					1	1	1	1	1	
REFM-OPT	10					1	1				
TOTAL	93	58	65	63	65	93	93	38	5	6	2

REFM Boxes – Mechanics and Integration.

- Preliminary layout ready
- 3D design – when Robert Wedel can start it in Solid Edge?
- High power amplifier (large block) – not needed anymore
- FMC for TMCB – not needed anymore

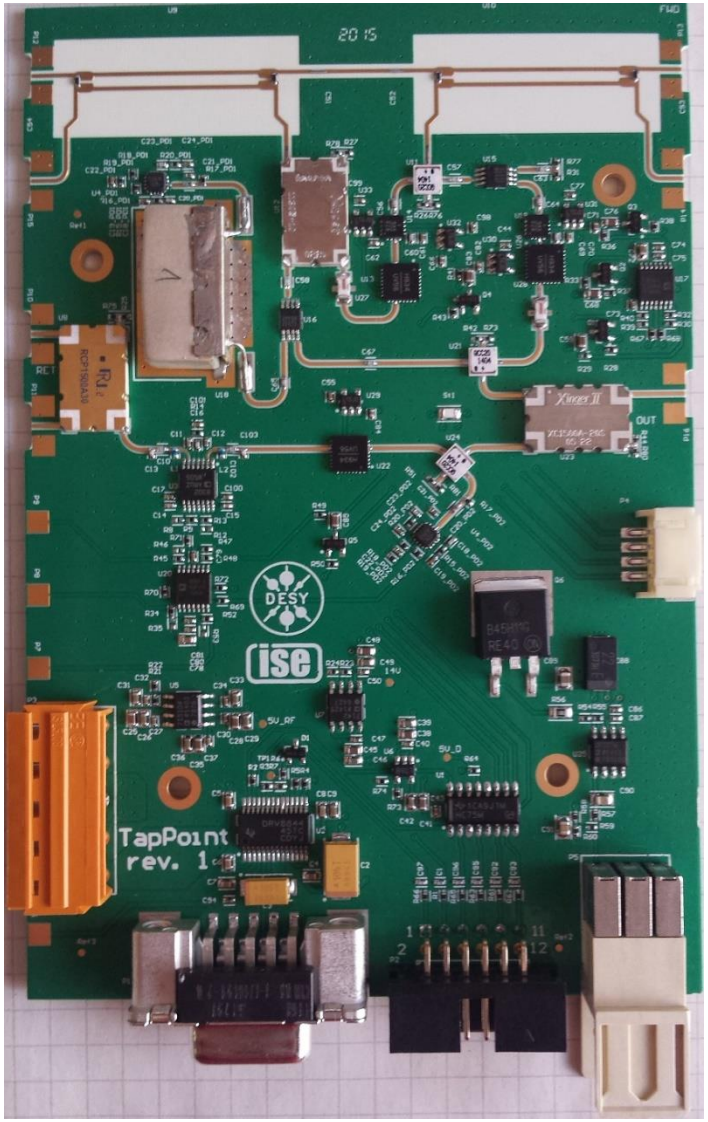
Interferometer – InCon.

- PCB in redesign stage
- Adding analog loops (phase and amplitude stabilization), switch, new amplifier
- Hardly visible phase noise degradation at board's output



Interferometer – TapPoint.

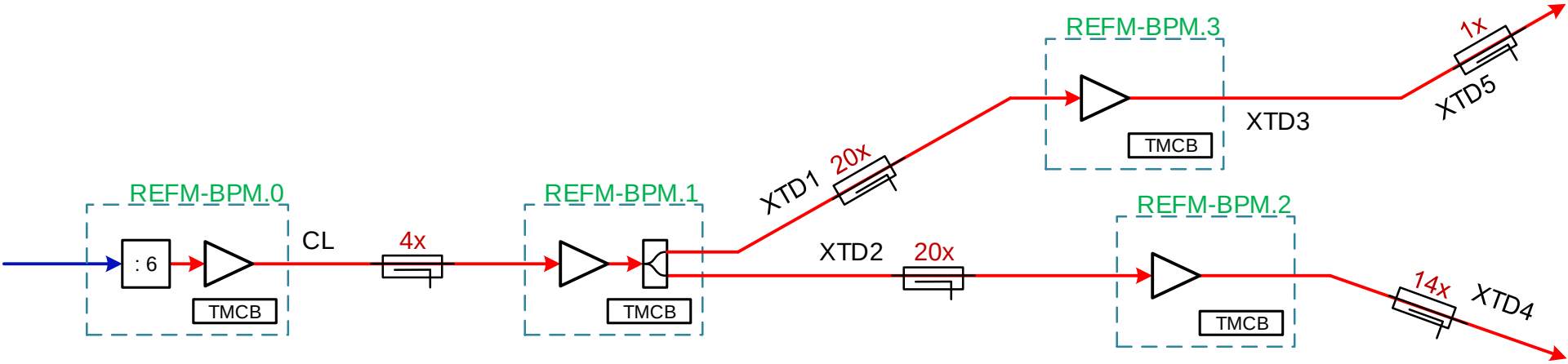
- 1st version (picture) ready for tests
- 2nd version in redesign stage:
  - Additional branch to keep stable signal at the TapPoint output
  - 40dBm main line amplifier no more needed – smaller one (1W) will be merged with TapPoint PCB



- Interferometer talk → Przemysław Kownacki

BPM System – Photon Tunnels.

- Main schematic with power budget ready
- 216 MHz power amplifier sample tested
- 216 MHz couplers samples ready for tests
- REFM-BPM.x locations still not fixed
- Frequency divider 1300 → 216 MHz not yet designed



Task Assignment.

- Project leaders – Krzysztof Czuba, Dominik Sikora
- Interferometer integration and tests – Przemysław Kownacki
- InCon design – Dawid Kołcz
- TapPoint design – Paweł Jatczak, Tomasz Owczarek
- PLL 3.9GHz – Paweł Gontarek
- Frequency divider – Tomasz Leśniak (?)
- Mechanics – Robert Wedel

- Altium project files are placed on SVN:
  - https://svnsrv.desy.de/desy/InterferometerMainBoard
  - https://svnsrv.desy.de/desy/TapPoint
- All documentation will be on N drive in folder: N:\4all\public\MSK_Projekte\RFSyn\XFEL_DistributionSystem

Open Points.

- Inner cabling
- Documentation
- DOOCS servers

Thank you for your attention !