Summary of Agency Inputs for Coherent Blue Book

20 June 2023

NASA

Low-Rate Coherent Signaling (1-25 Gbps)

	CNES	DLR	ESA	JAXA	NASA
General Comments	O3K LDPC Coding and Sync	No Input	No Input	HDR 1550 OB	HDR 1550 OB (as strawman)
Wavelengths	No Input	No Input	1530.33-1567.13, 1530.33-1537.- for DTE return 100 GHz spacing (TBC)	191.6-194.9 THz (1538.19-1564.68 nm) 100 GHz spacing	191.6-194.9 THz (1538.19-1564.68 nm) 100 GHz spacing
Channel Symbol Rate	No Input	No Input	10-25 GHz	2.5 or 10 GHz	2.5 or 10 GHz
Polarization	No Input	No Input	RHCP+LHCP	Single or unspecified	Single or unspecified
Modulation	No Input	No Input	QPSK, QAM	OOK, (D)BPSK, (D)QPSK	OOK, (D)BPSK, (D)QPSK
FEC	O3K Quasi-Cyclic LDPC, rate 9/10, 1/2	No Input	LDPC (5GNR or O3K)	DVB-S2, RS, JAXA to propose additional FEC at next F2F	DVB-S2, RS
Fading Mitigation	Block Interleaver	No Input	Erasure coding (131.5-O-1) or interleaving	Optional Convolutional Interleaver	Optional Convolutional Interleaver
Other Notes	Sync marker, in-band signaling	No Input	Recommend forward and return sub-bands for wavelengths (>16 nm separation)	DTN at application layer Decoding on spacecraft up to 1 Gbps/channel	No Input

High-Rate Coherent Signaling (100+ Gbps)

	CNES	DLR	ESA	JAXA	NASA
General Comments	No Input	No Input	No Input	Investigating commercial digital coherent standards	No Input
Wavelengths	No Input	No Input	No Input	No Input	No Input
Channel Symbol Rate	No Input	No Input	32 Gbaud	No Input	No Input
Polarization	No Input	No Input	RHCP+LHCP (dual pol)	No Input	No Input
Modulation	No Input	No Input	QPSK, QAM	No Input	No Input
FEC	No Input	No Input	OTN oFEC	No Input	No Input
Fading Mitigation	No Input	No Input	Erasure Coding (131.5-O-1)	No Input	No Input
Other Notes	No Input	No Input	No Input	No Input	No Input

Recommendations

- Agencies should review summary tables
  - Relevant/important signal characteristics
  - Agency recommendations

- Agencies should review recommendations in consideration of other agency inputs
  - Recommend initial focus on low-rate coherent (up to ~25 Gbps)