CLAIMS

What is claimed is:

1. A method comprising:

receiving, by a controller, a chromatic dispersion value indicating an amount of chromatic dispersion of an optical signal received at a coherent receiver integrated with a receiver optical network device;

comparing, by the controller, the chromatic dispersion value with a threshold, wherein the threshold defines an edge chromatic dispersion value at which the coherent receiver changes, according to a step function, a number of data points in a function used to compensate the chromatic dispersion; and

in response to determining that the chromatic dispersion value satisfies the threshold, performing at least one of:

configuring a switch to switch the optical signal to a dispersion compensation module (DCM) to cause the DCM to compensate the chromatic dispersion of the optical signal, or

adjusting a phase response of a filter of a coherent transmitter to compensate the chromatic dispersion of the optical signal.

2. The method of claim 1, wherein the DCM is included in an optical amplifier along an optical path.

3. The method of claim 1, wherein the function comprises a Fast Fourier Transform (FFT) used to compensate the chromatic dispersion.

4. The method of claim 1,

in response to determining that the chromatic dispersion value no longer satisfies the threshold, configuring the switch to switch the optical signal to bypass the DCM.

5. The method of claim 1, wherein the switch comprises a first switch, wherein the DCM comprises a first DCM, the method further comprising:

in response to determining that the chromatic dispersion value satisfies the threshold, configuring a second switch to switch the optical signal to a second DCM to cause the second DCM to compensate the chromatic dispersion of the optical signal.

6. The method of claim 1, wherein the switch comprises a first input and output pair to switch the optical signal to the DCM and a second input and output pair to switch the optical signal to bypass the DCM.

7. The method of claim 1, wherein the chromatic dispersion value comprises a first chromatic dispersion value, the method further comprising:

receiving, by the coherent receiver, the optical signal with a second chromatic dispersion value that is less than the first chromatic dispersion value; and

compensating, by the coherent receiver, the chromatic dispersion of the optical signal.

8. The method of claim 1, wherein in response to determining that the chromatic dispersion value satisfies the threshold, the performing comprises:

configuring the switch to switch the optical signal to the DCM to cause the DCM to compensate the chromatic dispersion of the optical signal.

9. The method of claim 1, wherein in response to determining that the chromatic dispersion value satisfies the threshold, the performing comprises:

adjusting the phase response of the filter of the coherent transmitter to compensate the chromatic dispersion of the optical signal.

10. The method of claim 1, wherein in response to determining that the chromatic dispersion value satisfies the threshold, the performing comprises:

configuring the switch to switch the optical signal to the DCM to cause the DCM to compensate the chromatic dispersion of the optical signal; and

adjusting the phase response of the filter of the coherent transmitter to compensate the chromatic dispersion of the optical signal.

11. A controller comprising:

a memory; and

one or more processors operably coupled to the memory, wherein the one or more processors are configured to:

receive a chromatic dispersion value indicating an amount of chromatic dispersion of an optical signal received at a coherent receiver integrated with a receiver optical network device;

compare the chromatic dispersion value with a threshold, wherein the threshold defines an edge chromatic dispersion value at which the coherent receiver changes, according to a step function, a number of data points in a function used to compensate the chromatic dispersion; and

in response to determining that the chromatic dispersion value satisfies the threshold, perform at least one of:

configure a switch to switch the optical signal to a dispersion compensation module (DCM) to cause the DCM to compensate the chromatic dispersion value of the optical signal, or

adjust a phase response of a filter of a coherent transmitter to compensate the chromatic dispersion of the optical signal.

12. The controller of claim 11, wherein the DCM is included in an optical amplifier along an optical path.

13. The controller of claim 11, wherein the function comprises a Fast Fourier Transform (FFT) used to compensate the chromatic dispersion.

14. The controller of claim 11, wherein the one or more processors are further configured to:

in response to determining that the chromatic dispersion value no longer satisfies the threshold, configure the switch to switch the optical signal to bypass the DCM.

15. The controller of claim 11, wherein the switch comprises a first switch, wherein the DCM comprises a first DCM, the one or more processors are further configured to:

in response to determining that the chromatic dispersion value satisfies the threshold, configure a second switch to switch the optical signal to a second DCM to cause the second DCM to compensate the chromatic dispersion of the optical signal.

16. An interconnection system comprising:

a coherent receiver integrated with a receiver optical network device;

a coherent transmitter; and

a controller,

wherein the coherent receiver is configured to:

receive an optical signal;

determine a chromatic dispersion value indicating an amount of chromatic dispersion of the optical signal;

send, to the controller, the chromatic dispersion value of the optical signal;

wherein the controller is configured to:

receive the chromatic dispersion value of the optical signal from the coherent receiver;

compare the chromatic dispersion value with a threshold, wherein the threshold defines an edge chromatic dispersion value at which the coherent receiver changes, according to a step function, a number of data points in a function used to compensate the chromatic dispersion; and

in response to determining that the chromatic dispersion value satisfies the threshold, perform at least one of:

configure a switch to switch the optical signal to a dispersion compensation module (DCM) to cause the DCM to compensate the chromatic dispersion of the optical signal, or

adjust a phase response of a filter of the coherent transmitter to compensate the chromatic dispersion of the optical signal.

17. The interconnection system of claim 16, wherein the coherent transmitter is configured to:

receive, from the controller, the adjusted phase response of the filter;

adjust the phase response of the filter; and

apply, by the coherent transmitter, the filter with the adjusted phase response to the optical signal.

18. The interconnection system of claim 16, wherein the-function comprises a Fast Fourier Transform (FFT) to compensate the chromatic dispersion.

19. The interconnection system of claim 16, wherein the controller is further configured to:

in response to determining that the chromatic dispersion value no longer satisfies the threshold, configure the switch to switch the optical signal to bypass the DCM.

20. The interconnection system of claim 16, wherein the switch comprises a first switch, wherein the DCM comprises a first DCM, the controller is further configured to:

in response to determining that the chromatic dispersion value satisfies the threshold, configure a second switch connected to a second DCM with a state to provide access to the second DCM to compensate the chromatic dispersion value of the optical signal.