CLAIMS

1. A method of determining an optical eye diagram of a modulated optical beam of an interferometer device, the method comprising:

obtaining AC parameters for one or more modulator structures of the interferometer device at respective DC bias voltages within a predetermined bias voltage range at an operating frequency of the one or more modulator structures from electrical simulation;

obtaining a carrier concentration profile from the electrical simulation;

obtaining optical parameters for the one or more modulator structures from optical simulation based on the carrier concentration profile; and

determining the optical eye diagram of the modulated optical beam based on the AC parameters and the optical parameters;

wherein the obtaining of the optical parameters comprises obtaining a matrix for the complex refractive index for the one or more modulator structures from the carrier concentration profile, converting the matrix for the complex refractive index into a matrix for the complex refractive index for the one or more modulator structures, and obtaining the optical parameters for the one or more modulator structures from the optical simulation.

2. The method as claimed in claim 1, wherein the AC parameters comprise the AC conductance and the AC capacitance.

3. The method as claimed in claims 1 or 2, wherein the optical parameters comprise the effective refractive index and loss.

4. The method as claimed in claim 1, wherein the obtaining the optical parameters is based on a device length of the respective modulator structures and a relevant wavelength.

5. The method as claimed in any one of the preceding claims, wherein determining the optical eye diagram of the modulated optical beam is further based on simulated beam amplitude and phase in the one or more arms of the interferometer associated with the one or more modulator structures respectively.

6. The method as claimed in any one of the preceding claims, comprising obtaining a time constant τ from the AC parameters corresponding to a modulating voltage signal for the one or more modulator structures, and calculating a transient response of the modulating voltage signal for the one or more modulator structures based on a time step chosen according to an operation speed of the one or more modulators.

7 The method as claimed in claim 6, comprising adding random noise to the modulating voltage signal.

8. The method as claimed in claims 6 or 7, the modulating voltage signal is converted from a random bit sequence generated using a random bit generator.

9. The method as claimed in any one of claims 6 to 8, comprising obtaining an electrical eye diagram based on the transient response of the modulating voltage signal for the one or more modulator structures.

10. The method as claimed in any one of claims 6 to 9, comprising calculating amplitude and phase change of the modulated optical beam for the one or more modulator structures using data obtained from the optical simulations.

11. The method as claimed in claim 10, comprising combining the optical beams in the interferometer device using their respective amplitude and phase values, and displaying an output beam intensity by overlapping the optical beams after every period.

12. A method of evaluating system performance of electro-optic devices, the method comprising performing the method of determining an optical eye diagram of a modulated optical beam of an interferometer device as claimed in any one of the preceding claims.

13. A system for determining an optical eye diagram of a modulated optical beam of an interferometer device, the system comprising:

means for obtaining AC parameters for one or more modulator structures of the interferometer device at respective DC bias voltages within a predetermined bias voltage range at an operating frequency of the one or more modulator structures from electrical simulation;

means for obtaining a carrier concentration profile from the electrical simulation;

means for obtaining optical parameters for the one or more modulator structures from optical simulation based on the carrier concentration profile; and

means for determining the optical eye diagram of the modulated optical beam based on the AC parameters and the optical parameters;

wherein the means for obtaining of the optical parameters is configured to obtain a matrix for the complex refractive index for the one or more modulator structures from the carrier concentration profile, convert the matrix for the complex refractive index into a matrix for the complex refractive index for the one or more modulator structures, and obtain the optical parameters for the one or more modulator structures from the optical simulation.

14. The system as claimed in claim 13, wherein the AC parameters comprise the AC conductance and the AC capacitance.

15. The system as claimed in claims 13 or 14, wherein the optical parameters comprise the effective refractive index and loss.

16. The system as claimed in claim 13, wherein the obtaining the optical parameters is based on a device length of the respective modulator structures and a relevant wavelength.

17. The system as claimed in any one of claims 13 to 16, wherein the means for determining the optical eye diagram of the modulated optical beam is configured to determine the optical eye

diagram further based on simulated beam amplitude and phase in the one or more arms of the interferometer associated with the one or more modulator structures respectively.

18. The system as claimed in any one of claims 13 to 17, comprising means for obtaining a time constant τ from the AC parameters corresponding to a modulating voltage signal for the one or more modulator structures, and means for calculating a transient response of the modulating voltage signal for the one or more modulator structures based on a time step chosen according to an operation speed of the one or more modulators.

19 The system as claimed in claim 18, wherein the means for obtaining the time constant is configured for adding random noise to the modulating voltage signal.

20. The system as claimed in claims 18 or 19, comprising means for converting the modulating voltage signal from a random bit sequence generated using a random bit generator.

21. The system as claimed in any one of claims 18 to 20, comprising means for obtaining an electrical eye diagram based on the transient response of the modulating voltage signal for the one or more modulator structures.

22. The system as claimed in any one of claims 18 to 21, comprising means for calculating amplitude and phase change of the modulated optical beam for the one or more modulator structures using data obtained from the optical simulations.

23. The system as claimed in claim 22, comprising means for combining the optical beams in the interferometer device using their respective amplitude and phase values, and displaying an output beam intensity by overlapping the optical beams after every period.

24. A data storage medium having stored thereon data code means for instructing a computing device to execute the method as claimed in any one of claims 1 to 12.