Claims

1. A system comprising: an electron beam source configured to generate one or more electron beams; a sample stage configured to secure a sample; an electron-optical column including a set of electron-optical elements configured to direct at least a portion of the one or more electron beams onto an edge portion of the sample, the set of electron-optical elements including at least one of one or more electron-optical lenses or one or more scanning elements; a detector assembly configured to detect electrons emanating from the sample; and a controller, wherein the controller is communicatively coupled to one or more portions of at least one of the electron beam source, the set of electron-optical elements of the electron-optical column or the sample stage, wherein the controller includes one or more processors configured for executing program instructions stored in memory, wherein the program instructions are configured to cause the one or more processors to: receive one or more parameters representative of one or more characteristics of the one or more electron beams at the edge portion of the sample; generate a look-up table for compensating for one or more fringe fields within the system via a simulation, wherein the generated look-up table includes a set of coefficients and corresponding fringe-field offsets, wherein the set of coefficients are a function of use conditions of electron beam energy, electron beam landing energy, and extracting field of the sample; and adjust one or more characteristics of the system based on the generated look-up table.

2. The system of claim 1, wherein the one or more processors are communicatively coupled to a stigmator of the electron-optical column, wherein the one or more processors are configured to control the stigmator to compensate for axial astigmatism caused by the one or more fringe fields.

3. The system of claim 2, wherein the one or more processors are communicatively coupled to the one or more electron-optical lenses of the electron-optical column, wherein the one or more processors are configured to control the one or more electron-optical lenses to compensate for defocus in the one or more electron beams caused by the one or more fringe fields.

4. The system of claim 2, wherein the one or more processors are communicatively coupled to voltage control circuitry in electrical communication with the sample, wherein the one or more processors are configured to control the voltage control circuitry to adjust a bias on the sample to compensate for defocus in the one or more electron beams caused by the one or more fringe fields.

5. The system of claim 2, wherein the one or more processors are configured to control the electron source to compensate for position offset caused by the one or more fringe fields.

6. The system of claim 2, wherein the one or more processors are configured to control the sample stage to compensate for position offset caused by the one or more fringe fields.

7. The system of claim 1, wherein the electron beam source comprises: one or more electron guns.

8. The system of claim 1, wherein the set of electron-optical elements comprises: one or more objective lenses.

9. The system of claim 1, wherein the set of electron-optical elements comprises: one or more condensing lenses.

10. The system of claim 1, wherein the set of electron-optical elements comprises: one or more scanning elements.

11. The system of claim 1, wherein the sample stage is configured to secure a wafer.

12. The system of claim 1, wherein the detector assembly comprises: at least one of one or more secondary electron detectors or one or more backscattered electron detectors.

13. A system comprising: an electron-optical system; and a controller, wherein the controller is communicatively coupled to one or more portions of at least one of the electron-optical system, wherein the controller includes one or more processors configured for executing program instructions stored in memory, wherein the program instructions are configured to cause the one or more processors to: receive one or more parameters representative of one or more characteristics of one or more electron beams at an edge portion of a sample; generate a look-up table for compensating for one or more fringe fields within the electron-optical system via a simulation, wherein the generated look-up table includes a set of coefficients and corresponding fringe-field offsets, wherein the set of coefficients are a function of use conditions of electron beam energy, electron beam landing energy, and extracting field of the sample; and adjust one or more characteristics of the electron-optical system based on the generated look-up table.

14. The system of claim 13, wherein the electron-optical system comprises: an electron beam source configured to generate the one or more electron beams.

15. The system of claim 13, wherein the electron-optical system comprises: a sample stage configured to secure the sample.

16. The system of claim 15, wherein the electron-optical system comprises: an electron-optical column including a set of electron-optical elements configured to direct at least a portion of the one or more electron beams onto an edge portion of the sample, the set of electron-optical elements including at least one of one or more electron-optical lenses or one or more scanning elements.

17. The system of claim 15, wherein the electron-optical system comprises: a detector assembly configured to detect electrons emanating from the sample.

18. The system of claim 13, wherein the electron-optical system is configured to perform inspection of the sample.

19. The system of claim 13, wherein the electron-optical system is configured to perform review of the sample.