CLAIMS

1. A method using a charged particle beam system of detecting defects in samples having a plurality of pattern repeat regions that are nominally identical, the method comprising, in order:

a first scan of a first part of a first pattern repeat region of the pattern repeat regions to generate first scan image data;

a second scan of a first part of a second pattern repeat region of the pattern repeat regions to generate second scan image data, the second pattern repeat region being spaced apart from the first pattern repeat region;

a third scan of a first part of a third pattern repeat region of the pattern repeat regions to generate third scan image data, the third pattern repeat region being spaced apart from the first pattern repeat region and the second pattern repeat region; and

a subsequent scan of a second part of the first pattern repeat region to generate fourth scan image data.

2. A method according to claim 1, wherein a pattern repeat regions of the sample is a region which contains a pattern that is repeated elsewhere on the sample.

3. A method according to claim 1 or 2, further comprising processing the first, second and third scan data to detect defects in one of the first, second or third pattern repeat regions.

4. A method according to claim 3, wherein processing the first, second and third scan data comprises processing a subset of each of the first, second and third scan data representing corresponding areas of the first second and third pattern repeat regions.

5. A method according to claim 3 or 4, wherein processing comprises:

a first sub-process of applying a first defect detection test to select a subset of one of the first, second and third scan image data as first selected data; and

a second sub-process of applying a second defect detection test to select a subset of the first selected data as second selected data.

6. A method according to claim 5, wherein the time taken for the first sub-process is less than or equal to the time interval between the start of the first scan and the start of the fourth scan.

7. A method according to any preceding claim, wherein the charged particle beam system has a plurality of beams and the first, second and third scans are performed such that the same beam is used to scan corresponding parts of respective pattern repeat regions.

8. A method according to any preceding claim, wherein each of the first, second and third scan image data comprises data from scans of multiple multi-beam field of views on the sample.

9. A method according to claim 8, wherein adjoining scans of the multiple multi-beam field of views are at least contiguous on the sample.

10. A method according to claim 8 or 9, wherein each multi-beam field of view of the multiple multi-beam field of views comprises multiple process areas, each process area corresponding to a field of view a beam of the plurality of beams.

11. A method of claim 10, wherein the first, second and third image data derived from scanning of at least one of the multi-beam field of views is achieved by overscanning.

12. A method of claim 11, wherein in the overscanning at least one of the beams of the plurality of beams associated with one of the multi-beam field of views is overscanned by pitch overscanning.

13. A method of any of claims 11 or 12, wherein using the overscanning at least one of the beams of the plurality of beams ensures similar beams of the plurality of beams are used to generate respective data of the first, second and third image data for processing to detect defects.

14. A method of any of preceding claim, wherein the subsequent scan scans an area of the sample that is at least contiguous with at least one of the first, second and third pattern repeat regions.

15. A method according to any preceding claim, further comprising buffering the first scan image data at least until generation of the second scan data image data is started.