

What is claimed is:

1. A system configured to detect defects on a wafer, comprising:

an inspection subsystem configured to scan a wafer to thereby generate frame images for the wafer, wherein the inspection subsystem comprises at least a light source and one or more detectors, wherein the inspection subsystem is further configured to direct light from the light source to the wafer, and wherein light from the wafer is collected and detected by the one or more detectors of the inspection subsystem during scanning to thereby generate the frame images; and

a computer subsystem configured for:

generating one or more test images for at least a portion of an array region in one or more dies on the wafer from one or more of the frame images;

generating a reference image for one or more cells in the array region from two or more of the frame images;

determining one or more difference images for at least one cell in at least the portion of the array region in the one or more dies by subtracting the reference image from one or more portions of the one or more test images corresponding to the at least one cell; and

detecting defects on the wafer in the at least one cell based on the one or more difference images determined for the at least one cell, wherein the defects comprise repeating defects.

2. The system of claim 1, wherein the light source comprises a broadband plasma light source.

3. The system of claim 1, wherein the inspection subsystem is further configured as a bright field tool.

4. The system of claim 1, wherein the computer subsystem is further configured for determining if the repeating defects are due to haze on a reticle used to print the wafer.

5. The system of claim 1, wherein the computer subsystem is further configured for generating the one or more test images by combining at least two of the frame images corresponding to the same locations in the one or more dies thereby creating additional image data for the wafer, and wherein the additional image data is used as the one or more test images in said determining one or more difference images.

6. The system of claim 5, wherein the at least two of the frame images comprise images of at least two of the one or more dies.

7. The system of claim 5, wherein the at least two of the frame images comprise images of at least two reticle fields printed on the wafer.

8. The system of claim 5, wherein the computer subsystem is further configured for performing said detecting using a predetermined threshold at a noise floor of output of a detector of the inspection subsystem.

9. A system configured to detect defects on a wafer, comprising:

an inspection subsystem configured to scan a wafer to thereby generate images for the wafer, wherein the inspection subsystem comprises at least a light source and one or more detectors, wherein the inspection subsystem is further configured to direct light from the light source to the wafer, and wherein light from the wafer is collected and detected by the one or more detectors of the inspection subsystem during scanning to thereby generate the images; and

a computer subsystem configured for:

- while the inspection subsystem is scanning the wafer, detecting defects on the wafer by applying a predetermined threshold to the images, wherein the predetermined threshold is at a noise floor of output of a detector included in the one or more detectors of the inspection subsystem;

- while the inspection subsystem is scanning the wafer, combining results of said detecting corresponding to the same locations in two or more dies or two or more reticle fields on the wafer;

- while the inspection subsystem is scanning the wafer, identifying one set of the defects that is detected at all of the same locations as repeating defects;

- while the inspection subsystem is scanning the wafer, identifying another set of the defects that is detected at fewer than all of the same locations as non-repeating defects; and

- generating inspection results for the wafer that comprise information for at least the repeating defects.

10. The system of claim 9, wherein the light source comprises a broadband plasma light source.

11. The system of claim 9, wherein the inspection subsystem is further configured as a bright field tool.

12. The system of claim 9, wherein the computer subsystem is further configured for performing said combining for only array regions of the two or more dies or the two or more reticle fields.

13. The system of claim 9, wherein the computer subsystem is further configured for determining if the repeating defects comprise two or more defects formed on the wafer due to haze on a reticle used to print the wafer.

14. The system of claim 9, wherein the computer subsystem is further configured for performing, said generating the inspection results by excluding information for the non-repeating defects from the inspection results.

15. The system of claim 9, wherein the computer subsystem is further configured for applying a nuisance filter to the non-repeating defects to identify at least one of the non-repeating defects that is an actual defect and at least one other of the non-repeating defects that is a nuisance.

16. A system configured to detect defects on a wafer, comprising:

- an inspection subsystem configured to scan a wafer to thereby generate images for the wafer, wherein the inspection subsystem comprises at least a light source and one or more detectors, wherein the inspection subsystem is further configured to direct light from the light source to the wafer, wherein light from the wafer is collected and detected by the one or more detectors of the inspection subsystem during scanning to thereby generate the images, wherein two or more reticle fields are printed on the wafer, and wherein each of the two or more reticle fields comprises two or more dies printed on the wafer; and

- a computer subsystem configured for:

- generating one or more test images for at least one of the two or more dies by averaging two or more of the images generated in the at least one die in two or more of the reticle fields;

generating one or more test images for another die on the wafer from two or more of the images generated in the other die in the two or more of the reticle fields;

determining one or more difference images for the at least one die by subtracting the one or more test images for the other on the wafer from the one or more test images for the at least one die; and

detecting defects on the wafer based on the one or more difference images.

17. The system of claim 16, wherein the computer subsystem is further configured to perform the averaging by performing a robust averaging.

18. The system of claim 16, wherein the computer subsystem is further configured for performing said generating, determining, and detecting only for logic regions in the two or more dies.

19. The system of claim 16, wherein the computer subsystem is further configured for determining if the defects comprise repeating defects.

20. The system of claim 16, wherein the defects comprise repeating defects, and wherein the computer subsystem is further configured for determining if the repeating defects are due to defects on a reticle used to print the wafer.

21. The system of claim 16, wherein the light source comprises a broadband plasma light source.

22. The system of claim 16, wherein the inspection subsystem is further configured as a bright field tool.