CLAIMS

1. A method for automatically detecting a state of a light source for semiconductor photolithography, the method comprising the steps of:

(a) obtaining at least a portion of an image of a light beam produced by the light source;

(b) obtaining image data from the portion;

(c) filtering the image data using template matching to detect a state of the light source;

(d) storing the results of the filtering operation in a database, wherein steps (a) through (c) are performed repeatedly over a period of time to detect the state repeatedly;

(e) determining an evolution of the state over time from the plurality of stored results of the filtering step;

(f) adjusting the light source after a period of time having a duration based at least in part on the evolution of the state over time; and

(g) performing steps (a) through (f) by a beam imaging or analysis tool which is configured to provide information about the beam parameters, wherein the beam imaging or analysis tool is a combined autoshutter metrology module.

2. The method as claimed in claim 1 wherein the state is an extent of existence of one or more features in the image.

3. The method as claimed in claim 2 wherein one of the one or more features in the image is a worm-like feature.

4. The method as claimed in claim 1 wherein the state is an extent of existence of one or more defects in at least one optical element in the light source.

5. The method as claimed in claim 4 wherein one of the one or more defects in the image is a slip plane defect.

6. The method as claimed in claim 1 wherein the step (d) of storing the results of the filtering operation in a database includes appending the results of the filtering operation to a database containing a plurality of previous results of performing steps (a) through (c).

7. The method as claimed in claim 6 wherein the results are appended using wrap-around indexing.

8. The method as claimed in claim 6 wherein the results are appended using bit shifting.

9. The method as claimed in claim 1 comprising an additional step of generating a video image from the results stored in the database.