Patent claims

1. A method for local stabilization of a radiation spot (S) on a remote target object (Z), wherein the radiation spot (S) is formed by a high energy laser beam (L) that is aimed at the target object (Z) by a high energy radiation emitter (1), and wherein the target object (Z) is illuminated by an illumination beam (B) that is aimed at the target object (Z) by an illumination device (2),

characterized in that,

- radiation (B') reflected by the target object (Z) that is illuminated by the illumination beam (B) is received by an image acquisition device (3);
- the radiation (B') reflected by the target object (Z) to the image acquisition device (3) passes through the same optical path (P) as the high energy laser beam (L);
- the image of the illuminated target object (Z) or part of the illuminated target object acquired by the image acquisition device (3) is analyzed and compared to at least one image of the illuminated target object (Z) or part of the illuminated target object produced at a prior point in time or to an image stored in an object database;
- proceeding from this comparison a correction signal is determined with which an optical correction device (12) arranged in the optical path (P) passed through by both the high energy laser beam (L) and the reflected radiation (B') is actuated,

characterized in that

- the analysis of the acquired image occurs by means of a least one image warping method, for which purpose a template image is used.

2. The method in accordance with claim 1,

characterized in that,

the illumination beam (B) has a has a wavelength that differs from the high energy laser beam (L).

3. The method in accordance with claim 1 or 2,
characterized in that
based on the comparison of the images of the illuminated target object (Z), or of a part of the illuminated target object, that were acquired or produced at different points in time, a prediction is made for a future image interference, and
in that the determination of the correction signal is made taking into account the predicted image interference.

4. The method in accordance with claim 1,
characterized in that
the quadratic pixel deviation between the acquired image and the warped template image is preferably minimized.

5. The method in accordance with claim 3,
characterized in that
the prediction is made for a future image interference based on the analysis of only part of the acquired image.

6. The method in accordance with any of the foregoing claims,
characterized in that
the illumination beam (B) emitted by the illumination device (2) is a laser beam.

7. A device for local stabilization of a radiation spot (S) on a distant target object (Z) according to a method in accordance with any of the foregoing claims,
characterized by

- an illumination device (2) for emitting an illumination beam (B) onto a target object (Z);
- a high energy laser (1) for emitting a high energy laser beam (L) onto the target object (Z);
- an optical correction device (12) that is provided in the optical path (P) of the high energy laser beam (L) and that may be actuated by a control device (36);
- a radiation decoupling device (10) that is provided in the optical path (P) of the high energy laser beam (L) and that is embodied for decoupling radiation (B') that is from this optical path (P) and that is received as a reflection of the illumination beam (B) and to guide said radiation onto an image acquisition device (3); and,
- an image processing device (34) that is connected to the image acquisition device (3) for transmitting an image signal therefrom and that is provided with a control device (36) that is designed for producing a correction signal and that, for transmitting the correction signal (K), is connected to a control device (11) for the optical correction device (12),

characterized in that

- the image of the illuminated target object (Z) or part of the illuminated target object acquired by the image acquisition device (3) is analyzed and compared to at least one image of the illuminated target object (Z) or part of the illuminated target object produced at a prior point in time or to an image stored in an object database;
- the analysis of the acquired image occurs by means of a least one image warping method, for which purpose a template image is used.

8. The device in accordance with claim 7,
characterized in that

the image acquisition device (3) is formed by a high speed camera or has the like.

9. The device in accordance with claim 7 or 8,
characterized in that
the optical correction device (12) is formed by a tip/tilt mirror or has the like.