CLAIMS

1. A method of detecting inconsistencies in a structure, the method comprising:

directing a pulsed laser beam towards the structure, wherein surface waves and shear waves are formed in the structure when radiation of the pulsed laser beam is absorbed by the structure; and

detecting the surface waves and the shear waves at a point detector to form data, wherein the point detector is formed on a surface of the structure.

2. The method of claim 1, further comprising:

identifying a crack in the structure using the data representing the surface waves.

3. The method of claim 1, wherein the surface waves are transmitted through a joint in the structure.

4. The method of claim 1, further comprising:

identifying corrosion in the structure using data representing the shear waves.

5. The method of claim 1, further comprising:

identifying inconsistencies on a far side of the structure using the data representing the shear waves.

6. The method of claim 1, wherein the pulsed laser beam and the point detector are spaced apart such that both the surface waves and shear waves are detected.

7. The method of claim 1, wherein the structure is a homogenous material.

8. The method of claim 1, wherein the structure is formed of at least one of a composite, a metal, a ceramic, a polymeric material, a semi-conductor material, or a glass material.

9. The method of claim 1, wherein the structure is a single layer.

10. The method of claim 1, wherein directing the pulsed laser beam towards the structure comprises positioning a line pump perpendicular to a direction of a joint such that ultrasonic signals travel entirely through the joint when the point detector is positioned over the joint.

11. The method of claim 1, wherein the point detector is significantly smaller than a distance between the pulsed laser beam and the point detector on the surface of the structure.

12. A method comprising:
directing a pulsed laser beam towards a structure, wherein the pulsed laser beam is a line on a surface of the structure, wherein a plurality of types of ultrasonic signals is formed in the structure when radiation of the pulsed laser beam is absorbed by the structure, and wherein the plurality of types of ultrasonic signals includes surface waves and shear waves;
detecting the plurality of types of ultrasonic signals to form data, wherein the plurality of types of ultrasonic signals are detected using a single point detector formed by an interferometer, wherein the pulsed laser beam and a single point detector are spaced apart such that the plurality of types of ultrasonic signals is detected by the single point detector; and

determining an inconsistency is present in the structure using the data.

13. The method of claim 12, wherein the structure is formed of a single layer.

14. The method of claim 12, wherein the inconsistency includes at least one of a joint inconsistency, corrosion, an inconsistency on a far side of the structure, or a crack.

15. The method of claim 12, wherein directing the pulsed laser beam towards the structure comprises positioning the line on the surface of the structure perpendicular to a direction of a joint such that ultrasonic signals travel entirely through the joint when the single point detector is positioned over the joint.

16. The method of claim 12, wherein the single point detector is significantly smaller than a distance between the pulsed laser beam and the single point detector on the surface of the structure.

17. An apparatus comprising:
a pulsed laser beam forming a line pump on a first surface of a structure; and
a pulsed laser beam forming a point detector on the first surface of the structure wherein the line pump and the point detector are spaced a distance apart, wherein the distance is selected such that the point detector detects surface waves and shear waves from the structure.

18. The apparatus of claim 17, wherein the pulsed laser beam forming the line pump is provided by laser ultrasonic equipment.