

WHAT IS CLAIMED IS:

1. A detector module, which is arranged on a detector arm, comprising one or a plurality of detector units arranged in a scattered configuration, wherein each of the detector units in the detector module is installed aiming at a beam center of a ray source, and wherein an angle at which each of the detector units is installed is different from each other and related to a height of the corresponding detector unit in the detector arm, so as to ensure each of the detector units to be aimed at the beam center.

2. The detector module of claim 1, wherein the ray source is an X/Gamma-ray source.

~~3. The detector module of claim 1, wherein an angle at which each of the detector units is installed is different from each other and related to a height of the corresponding detector unit in the detector arm, so as to ensure each of the detector units to be aimed at the beam center.~~

~~43.~~ The detector module of claim 1 or claim 2, wherein the detector module is a detector circuit board fixed to the detector arm, and a shape of the detector circuit board is related to a position of the detector circuit board on the detector arm.

~~54.~~ The detector module of claim ~~43~~, wherein the shape of the detector circuit board comprises a rectangle or a parallelogram in which the difference in adjacent interior angles is gradually increased.

~~65.~~ The detector module of claim ~~54~~, wherein, when the shape of the detector circuit board is the rectangle, the rectangular detector circuit board on a detector arm is arranged in the same horizontal plane position as the ray source; and

when the shape of the detector circuit board is the parallelogram, the parallelogram detector circuit board in which the difference in adjacent interior angles is gradually increased is arranged above or below the same horizontal plane position as the ray source, wherein the smaller interior angle of the parallelogram is equal to an included angle between the detector arm and ray beams from a beam center of the ray source.

~~67.~~ The detector module of any one of claims ~~4-6~~ 3 to 5, wherein the detector units are fixed to the detector circuit board and connected to a data acquisition and control module via connection terminals, and crystals and diodes of the detector units are coupled with each other by way of end face or side face.

~~87.~~ A method for installing detector modules, wherein each of the detector modules

comprises one or a plurality of detector units arranged in a scattered configuration, and the method comprises:

installing the detector modules on a detector arm; and

aiming each of the detector units in each of the detector modules at a beam center of a ray source, wherein an angle at which each of the detector units is installed is related to a height of the corresponding detector unit in the detector arm.

98. The method of claim 87, wherein the ray source is an X/Gamma-ray source.

~~10. The method of claim 8, wherein an angle at which each of the detector units is installed is related to a height of the corresponding detector unit in the detector arm.~~

~~149.~~ The method of claim 7 or claim 8, wherein the detector modules are respectively fixed to detector circuit boards on the detector arm, and shapes of the detector circuit boards are respectively related to a position of the detector circuit board on the detector arm.

~~1210.~~ The method of claim ~~149~~, wherein the shape of the detector circuit board comprises a rectangle or a parallelogram in which the difference in adjacent interior angles is gradually increased~~;~~.

~~1311.~~ The method of claim ~~1210~~, wherein when the shape of the detector circuit board is the rectangle, the rectangular detector circuit board on a detector arm is arranged in the same horizontal plane position as the ray source; and when the shape of the detector circuit board is the parallelogram, the parallelogram detector circuit board in which the difference in adjacent interior angles is gradually increased is arranged above or below the same horizontal plane position as the ray source, wherein the smaller interior angle of the parallelogram is equal to an included angle between the detector arm and ray beams from a beam center of the ray source.

~~1412.~~ The method of any one of claims ~~11-139~~ to 11, further comprising: fixing the detector units to the detector circuit boards and connecting the detector units to a data acquisition and control module via connection terminals, and coupling crystals of the detector units with diodes thereof by way of end face or side face.

~~1513.~~ A ray detection system, comprising a ray imaging subsystem configured to generate ray transmission images, wherein the ray imaging subsystem comprises:

a ray source configured to generate ray pulses capable of penetrating a detected object;

detector modules arranged on a detector arm and comprising one or a plurality of detector

units arranged in a scattered configuration, wherein each of the detector units in each of the detector module is installed to be aimed at the ray source, and the detector modules receive the ray pulses generated from the ray source as being capable of penetrating the detected object and converting the ray pulses into output signals; and

a data acquisition and control module configured to generate digital image signal in real time according to the output signals, wherein an angle at which each of the detector units is installed is related to a height of the corresponding detector unit in the detector arm.

~~16~~14. The ray detection system of claim ~~15~~13, wherein the ray source is an X/Gamma-ray source.

~~17. The ray detection system of claim 15, wherein an angle at which each of the detector units is installed is related to a height of the corresponding detector unit in the detector arm.~~

~~18~~15. The ray detection system of claim 13 or claim 14~~claim 15~~, wherein the detector modules are detector circuit boards fixed to a support of the detector arm, and a shape of the detector circuit board is related to a position of the detector circuit board in the arm support of the detector.

~~19~~16. The ray detection system of claim ~~18~~15, wherein the shapes of the detector circuit board comprise a rectangle or a parallelogram in which the difference in adjacent interior angles is gradually increased.

~~20~~17. The ray detection system of claim ~~19~~16, wherein when the shape of the detector circuit board is the rectangle, the rectangular detector circuit board on a detector arm is arranged in the same horizontal plane position as the ray source; and when the shape of the detector circuit board is the parallelogram, the parallelogram detector circuit board in which the difference in adjacent interior angles is gradually increased is arranged above or below the same horizontal plane position as the ray source, wherein the smaller interior angle of the parallelogram is equal to an included angle between the detector arm and ray beams from a beam center of the ray source.

~~21~~18. The ray detection system of any one of claims ~~18-20~~15 to 17, wherein the detector units are fixed to a detector circuit board and connected to a data acquisition and control module via connection terminals, and crystals and diodes of the detector units are coupled with each other by way of end face or side face.