estimating measurement data on scattered waves radiated from the measurement area in relation to waves that are incident on the measurement area when the condition in the measurement area is known is called a forward problem and easy. However, obtaining the condition in the measurement area when measurement data on scattered waves is known is called an inverse problem and is not easy.

[0006]

When an object moves in the measurement area, the position of the object becomes uncertain, making it difficult to image the object with high accuracy.

[0007]

In view of this, embodiments of the present disclosure provide an imaging device or the like that is capable of imaging a moving object in the measurement area with high accuracy.

[Solution to Problem]

[0008]

An imaging device according to one aspect of the present disclosure includes: a plurality of transmitters that each transmit a wave to a measurement area; a plurality of receivers that each receive a scattered wave of the wave from the measurement area; and an information processing circuit that images an object in the measurement area using measurement data of the scattered wave. In imaging the object, the information processing circuit: derives, using the measurement data and a velocity vector of the object, a scattering field function that receives a transmission position of the wave and a reception position of the scattered wave as input and outputs an amount of the scattered wave at the reception position; derives an imaging function that receives an imaging target position as input and outputs an image intensity at the imaging target position, and is defined using an amount output from the scattering field function in response to inputting the imaging target position into the scattering field function as the transmission position and the reception position; and images the object in the measurement area using the imaging function. In deriving the scattering field function, the information processing circuit derives the scattering field function from the measurement data using a coordinate system that is determined using the velocity vector and in which a position of the object is fixed in at least two directions.

[0008a]

An imaging method according to another aspect of the present disclosure includes: transmitting, by each of a plurality of transmitters, a wave to a measurement area; receiving, by each of a plurality of receivers, a scattered wave of the wave from the measurement area; and imaging an object in the measurement area using measurement data of the scattered wave, wherein the imaging of the object includes: deriving, using the measurement data and a

velocity vector of the object, a scattering field function that receives a transmission position of the wave and a reception position of the scattered wave as input and outputs an amount of the scattered wave at the reception position; deriving an imaging function that receives an imaging target position as input and outputs an image intensity at the imaging target position, and is defined using an amount output from the scattering field function in response to inputting the imaging target position into the scattering field function as the transmission position and the reception position; and imaging the object in the measurement area using the imaging function, and in the deriving of the scattering field function, the scattering field function is derived from the measurement data using a coordinate system that is determined using the velocity vector and in which a position of the object is fixed in at least two directions.

[0009]

These general or specific aspects may be implemented as a system, a device or apparatus, a method, an integrated circuit, a computer program, or a non-transitory computer-readable recording medium such a CD-ROM, or any combination thereof.

[Advantageous Effects of Invention]

[0010]

According to embodiments of the present disclosure, it is possible to image a moving object in the measurement area with high accuracy.

[Brief Description of Drawings]

[0011]

[FIG. 1]

FIG. 1 is a conceptual diagram showing a one-dimensional multistatic array antenna.

[FIG. 2]

FIG. 2 is a conceptual diagram showing the relationship between a transmission point and a reception point in a plane.

[FIG. 3]

FIG. 3 is a conceptual diagram showing an example of coordinates relating to a semi-two-dimensional array antenna.

[FIG. 4]

FIG. 4 is a conceptual diagram illustrating the relationship between a plurality of transmitters, a plurality of receivers, and a flying object.

[FIG. 5]

FIG. 5 is a conceptual diagram illustrating two coordinate systems when a one-dimensional array transmitting/receiving array antenna is used.

[FIG. 6]

FIG. 6 is a conceptual diagram illustrating two coordinate systems when a semi-two-dimensional array transmitting array