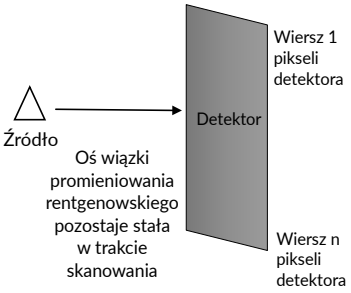
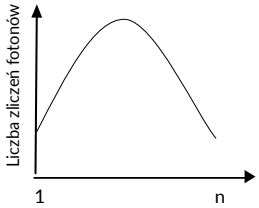
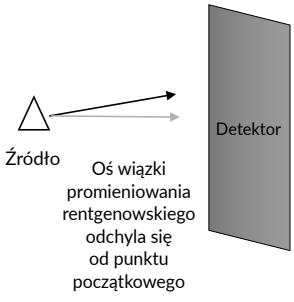
Skanowanie przebiega bez zmian właściwości geometrycznych źródła promieniowania rentgenowskiego

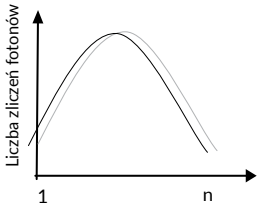




W trakcie skanowania profil oświetlenia każdej projekcji jest zgodny z profilem oświetlenia projekcji „white refference”

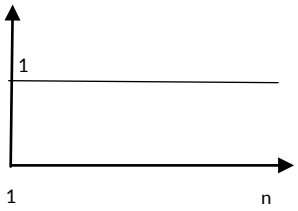
W trakcie skanowania centrum oświetlenia detektora zmienia położenie

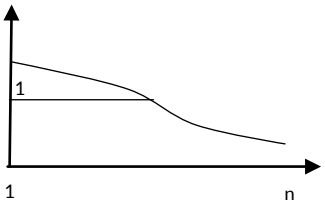


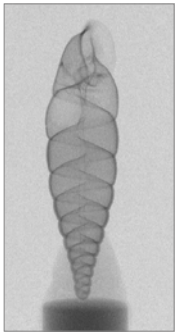


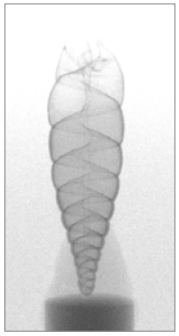
W trakcie skanowania profil oświetlenia każdej projekcji (czarna linia) zmienia się w stosunku do oświetlenia projekcji „white refference” (szara linia)

Podczas korekcji „white refference” obraz projekcji podlega dzieleniu przez obraz „white refference”. Jeśli są one zgodne, nie występuje żadne odchylenie jasności obrazu. Jeśli centrum oświetlenia jest względem siebie przesunięte, widoczna będzie zmiana jasności obrazu









UNIWERSYTET ŚLĄSKI
W KATOWICACH

Method of determination of physical parameters of an object imaged using computer tomograph and equipment for implementation of said method

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UNIWERSYTET ŚLĄSKI W KATOWICACH
UNIA EUROPEJSKA
EUROPEJSKI FUNDUSZ SPOŁECZNY

Projekt współfinansowany ze środków Europejskiego Funduszu Rozwoju Regionalnego w ramach Programu Operacyjnego Innowacyjna Gospodarka

DOTACJE NA INNOWACJE – inwestujemy w Waszą przyszłość

Detector based Phantom Standardized phantom for X-ray microtomography localized out of sample tray

Patent pending in Polish Patent Office, EPO & USPTO

The core of the invention lies in a method of determination of physical parameters of the object imaged using computer tomograph, in particular determination of absolute parameters of physical density and/or X-ray absorption coefficient. The reference of the determined physical parameters is installed on the detector, outside the rotating tomograph platform where the scanned object is placed. It is followed by object scanning, during which the images of tomographic projections record simultaneously the two-dimensional image of the studied object and the two-dimensional image of the reference. For projections for at least one reference area the value of image greyscale intensity is estimated in relative units by readout of pixel value from the projection image. This value reflects the X-ray radiation intensity in greyscale after passing through the scanner chamber and the reference. Obtained results are used as a basis for calculations of coefficients of calibration function, preferably using linear regression, then the calibration function is substituted with a variable, namely the value determined from the pixel value from the projection image. This value reflects the intensity of X-rays in greyscale after passing through the scanner chamber and the scanned object and the value of calibration function is calculated. This value reflecting the value of the physical parameter and it is stored, preferably in the same pixel in the projection, then on the basis of thus determined projection a computer image reconstruction takes place. The result of image reconstruction represents in the absolute scale values of the determined physical parameter.
The core of the invention is also contained in the equipment for using this method.

MAPh - MApped PHantom Standardized phantom for X-ray microtomography with individually measured quality and spatial distribution of material

Patent pending in Polish Patent Office, EPO & USPTO

PThe subject of the invention comprises of a method of mapping of distribution of reference physical parameters used in tests applying electromagnetic waves. In particular in planar or spatial tests of objects imagined using a computer tomograph, wherein the entire reference or its fragments of components used in its design and forming determinants of its physical parameters are imaged by high-resolution scanning. The imaging is performed at least twice, preferably five times higher than the resolution in which the reference will be used in future studies and a collection of layered images of a reference is obtained. The reading information out of the image of the particular cross-section, material distribution and/or absorption coefficient distribution is determined directly, with the information about the absorption coefficient, together with coordinates for every voxel. The spatial distribution of the absorption coefficient for the particular reference element is stored in a three-dimensional matrix, in electronic memory, with said information being used to calculate the correction coefficient. It defines for every voxel the deviation of parameters of the particular part of the reference from the theoretical value resulting from manufacturing assumptions. The definition forms so called map of manufacturing precision, individual for the particular element of the reference, and then the individual manufacturing precision map for a part of the reference or its elements is written into a common file forming the manufacturing precision definition for the entire reference.

DECOID
Detection and Correction of X-ray microtomography image distortion

Patent pending in Polish Patent Office, EPO & USPTO

The subject of the invention comprises method of determination of distortion value and/or distortion correction value for a projection image obtained during computer tomography routine, with application, in particular, in control of the scanning process. The method is characterised during the first stage, during object scanning, the value of image distortion and/or its possible change present in individual projection images is determined, by determining the central point, namely the detector spot which receives the most intense irradiation from the X-ray source and/or by determination of calibration image and projection image parameter deviation and/or by comparison of projection images, including comparison of projection images with calibration images. The second stage includes an optional correction of projection image distortion, or when the distortion value exceeds the permitted limit during scanning, the scanning is automatically aborted.