1. Record Nr. UNINA9910139507403321

Titolo	Tomography [[electronic resource] /] / edited by Pierre Grangeat
Pubbl/distr/stampa	London, : ISTE Hoboken, NJ, : Wiley, 2009
ISBN	1-282-69084-1 9786612690846 0-470-61178-2 0-470-61037-9
Descrizione fisica	1 online resource (458 p.)
Collana	ISTE ; ; v.142
Altri autori (Persone)	GrangeatPierre
Disciplina	616.07/57 616.0757
Soggetti	Tomography Cross-sectional imaging
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Tomography; Table of Contents; Preface; Notation; Chapter 1. Introduction to Tomography; 1.1. Introduction; 1.2. Observing contrasts; 1.3. Localization in space and time; 1.4. Image reconstruction; 1.5. Application domains; 1.6. Bibliography; Part 1. Image Reconstruction; Chapter 2. Analytical Methods; 2.1. Introduction; 2.2. 2D Radon transform in parallel-beam geometry; 2.2.1. Definition and concept of sinogram; 2.2.2. Fourier slice theorem and data sufficiency condition; 2.2.3. Inversion by filtered backprojection; 2.2.4. Choice of filter; 2.2.5. Frequency-distance principle 2.3. 2D Radon transform in fan-beam geometry2.3.1. Definition; 2.3.2. Rebinning to parallel data; 2.3.3. Reconstruction by filtered backprojection; 2.3.4. Fast acquisitions; 2.3.5. 3D helical tomography in fan-beam geometry with a single line detector; 2.4. 3D X-ray transform in parallel-beam geometry; 2.4.1. Definition; 2.4.2. Fourier slice theorem and data sufficiency conditions; 2.4.3. Inversion by filtered backprojection; 2.5. 3D Radon transform; 2.5.1. Definition; 2.5.2. Fourier slice theorem; 2.5.3. Inversion by filtered backprojection; 2.6. 3D positron emission tomography

Sommario/riassunto

The principle of tomography is to explore the structure and composition of objects non-destructively along spatial and temporal dimensions, using penetrating radiation, such as X- and gamma-rays, or waves, such as electromagnetic and acoustic waves. Based on computer-assisted image reconstruction, tomography provides maps of parameters that characterize the emission of the employed radiation or waves, or their interaction with the examined objects, for one or several cross-sections. Thus, it gives access to the inner structure of inert objects and living organisms in their full complexity. In