

Title (en)

System and method for producing pulsed monochromatic X-rays

Title (de)

Verfahren und Vorrichtung zur Erzeugung von gepulsten monochromatischen Röntgenstrahlen

Title (fr)

Dispositif et procédé pour la production de rayons-x monochromatiques pulsés

Publication

EP 1209956 A1 20020529 (EN)

Application

EP 00310471 A 20001124

Priority

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Abstract (en)

A system for generating tunable pulsed monochromatic X-rays comprises a tabletop terawatt laser delivering 10 Joules of energy in 10 ps at a wavelength of 1.1 microns. The light beam from the laser is counter-propagated against an electron beam produced by a linear accelerator. X-ray photons are generated by inverse Compton scattering that occurs as a consequence of the "collision" that occurs between the electron beam and IR photons generated by the laser. The system uses a novel pulse structure comprising, in a preferred embodiment, a single micropulse. The LINAC is configured to generate an electron beam having 1 nanocoulomb, of charge in a microbunch having a pulse length of about 5 picoseconds or less (or an electron beam brightness of 10^{12} A/m² - radian² 500 A). A beam alignment sub-system is used at the laser beam - electron beam interaction zone and directs the X-ray beam, in a preferred embodiment, through a beryllium window and onto mosaic crystals which divert the beam into a beam transport system toward the imaging target. <IMAGE>

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H05G 2/00

IPC 8 full level

G21K 1/06 (2006.01); **H05G 2/00** (2006.01)

CPC (source: EP)

G21K 1/06 (2013.01); **H05G 2/00** (2013.01)

Citation (search report)

- [XY] US 5353291 A 19941004 - SPRANGLE PHILLIP A [US], et al
- [XA] US 6035015 A 20000307 - RUTH RONALD D [US], et al
- [DY] US 4598415 A 19860701 - LUCCIO ALFREDO U [US], et al
- [A] EP 0535905 A1 19930407 - NCR INT INC [US]
- [YA] PATENT ABSTRACTS OF JAPAN vol. 1998, no. 11 30 September 1998 (1998-09-30)

Cited by

DE102008038427A1; CN111433635A; US7310408B2; US8712138B2

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