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ESI 2019 Project Day Technologies - ESA

OPTICAL REFLECTOR ELEMENT FOR X-RAY APPLICATIONS

TECHNOLOGY DESCRIPTION

Optical reflector system of X-Ray, gamma-rays or high-energy particles

The system is composed by a stack of superposed and curved silicon plates. Each plate has a reflecting top face and a bottom face carrying ribs forming spaces between two successive plates. The formed stack of reflecting faces is used to focus radiation based in a grazing incidence of the ray (i.e. low angle between the ray and the reflecting surface).

ADDED-VALUE AND BENEFITS

→ Lighter weight than comparable devices.
→ Reduced production and integration costs.
→ Adopted “stack” configuration to obtain a rigid structure.
→ The optics is modular and low-cost.

APPLICATION

This technology can benefit any sector where measurements by X-Ray devices are relevant, such as in quality control (materials testing) and medical and scientific applications (X-ray spectroscopy, X-ray photoelectron spectroscopy, X-ray crystallography). The system also applies to other wavelengths: gamma rays, and high-energy particles.

TECHNOLOGY READINESS

A prototype has been tested under industrial resembling conditions.

IP STATUS - ESA PAT 499

This technology is protected by three patents (France, Japan, USA). FR2866438, JP2005234573, US2005185306.

Can be extended by “Method for assembling a mirror plate stack" (ESA PAT 554).

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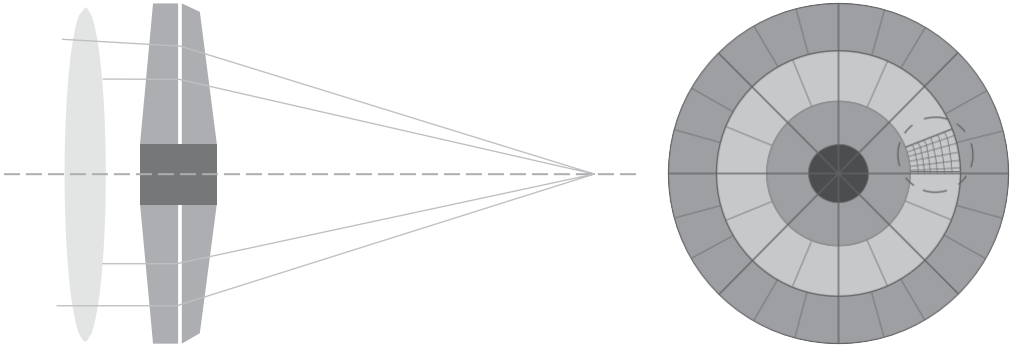

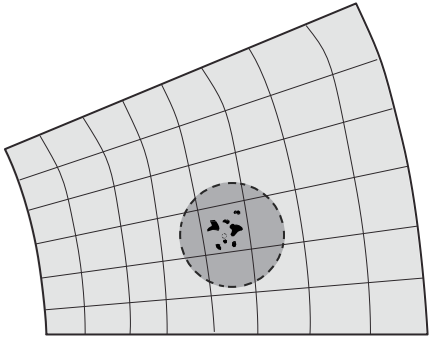

More information:
http://www.esa.int/Our_Activities/Space_Engineering_Technology/Novel_X-ray_imaging_optics_for_improved_medical_diagnosis_material_testing_and_lithography

Contact: patent@esa.int

Thank you

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