Docket #: S12-318

Photo Emitter X-Ray Source Array (PeXSA)

Stanford researchers have developed a method that can enable new X-ray imaging modalities by creating an X-ray source that can be patterned. This new source enables new imaging modalities such as 3-D differential phase contrast (DPC) imaging, X-ray point sources with a spatial resolution of less than 20 nm, and X-ray spectroscopic imaging by combining both temporal and spatial imaging modalities. This invention is useful for x-ray baggage screening at airports as well as DPC imaging for medical applications.

Applications

- **Baggage and industrial inspections** - Differential phase contrast imaging of baggage for DHS applications, non-destructive testing and other industrial inspection applications.
- **DPC imaging for medical applications**, X-ray spectroscopy with nano-sized spatial resolution, potential X-ray beam steering, coherent X-ray imaging and metrology

Advantages

- **Improves upon current DPC methods** due to PeXSA source:
  - Expensive grating in front of conventional X-ray sources is not needed
  - Creates a coherent source enabling interferometric, time resolved measurements such as shadowgraph or Schlieren measurements of objects
- **High resolution and contrast**
- **New features** enables new X-ray imaging modalities

Publications

- Lambertus Hesselink, Max Yuen, Ching-Wei Chang, Yao-Te Cheng and Yuzuru Takashima, "Novel 3D x-ray differential phase-contrast imaging system," *SPIE Newsroom*, November 1, 2016.

Patents

- Published Application: 20140079188
- Issued: 9,520,260 (USA)

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