Docket #: S19-123

Single Shot Analyzer Grating for Differential Phase Contrast X-ray Imaging and Computed Tomography

Stanford researchers have developed an exceptionally fast, sensitive, and compact X-ray imaging system for distinguishing liquids and other materials in aviation security applications. Whereas traditional dual-energy computed tomography (CT) systems have difficulty identifying explosive liquids or powders in security inspections, this new system uses Differential Phase Contrast (DPC) to greatly increase the contrast when imaging liquids or low-density materials. DPC provides a tri-signature derived from three independent material property measurements: standard absorption (ABS); index of refraction (DPC); and dark field scattering (VIS), to produce an image that can then be processed and analyzed for automated material identification. This DPC technology enables new inspection techniques as well as automatic discrimination systems to detect explosive threats. In particular, DPC could substantially increase the speed and accuracy of security screening by discriminating between hazardous and non-hazardous liquids and low-density powders in cluttered baggage and containers.

Applications

- X-ray/CT scanning for security applications (aviation, building, etc.)

Advantages

- Increased contrast for low density materials
- Improved detection of explosive materials and ability to distinguish hazardous and non-hazardous materials
- Increased speed, sensitivity, and accuracy

Patents

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