

Backscatter X-ray Body Inspection System NUCTECH



What Problems We Solve



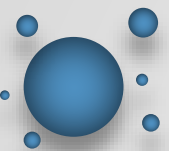
Traditional method: Metal detector + manual inspection

- ❌ Metal detector: Metal only
- ❌ Metal detector: Not exact location
- ❌ Manual: Body contact and privacy problem

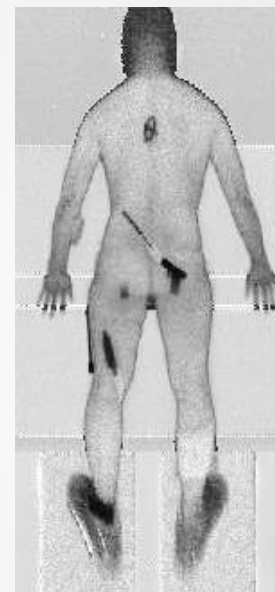
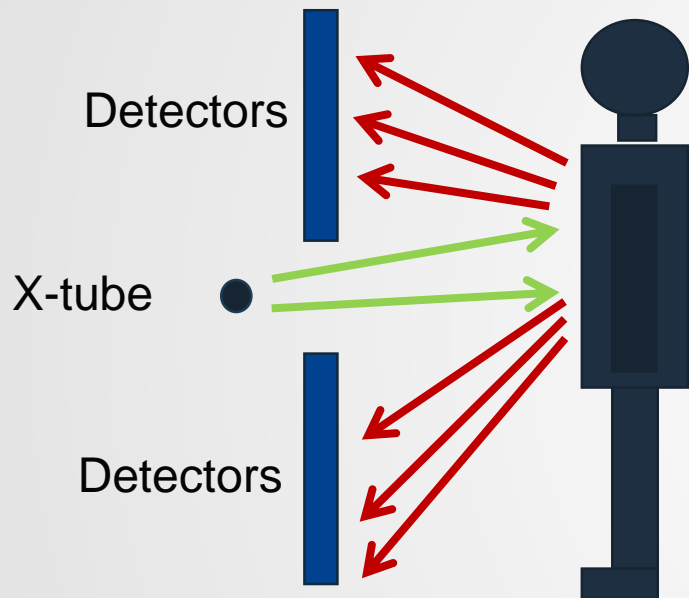


New method: Non-contact imaging

- ✅ Detects various kinds of contraband
- ✅ Displays exact locations
- ✅ Non-contact



Body Backscatter – BX Series



Density

Collection of points
Backscatter

Grey-scale
Shape

BX Series



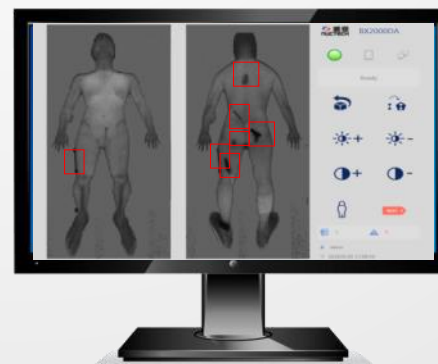
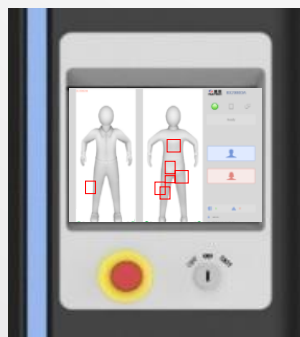
BX1000SA
Single side scan



BX2000DA
Dual-side scan

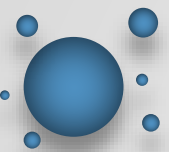
Parameters

- Scan time: 7s/side (BX1000)
10s (BX2000)
- Resolution: 1 mm (BX1000)
0.5 mm (BX2000)
- Dose per inspection: $< 0.1 \mu\text{Sv}$

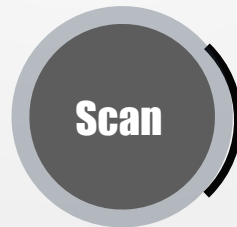
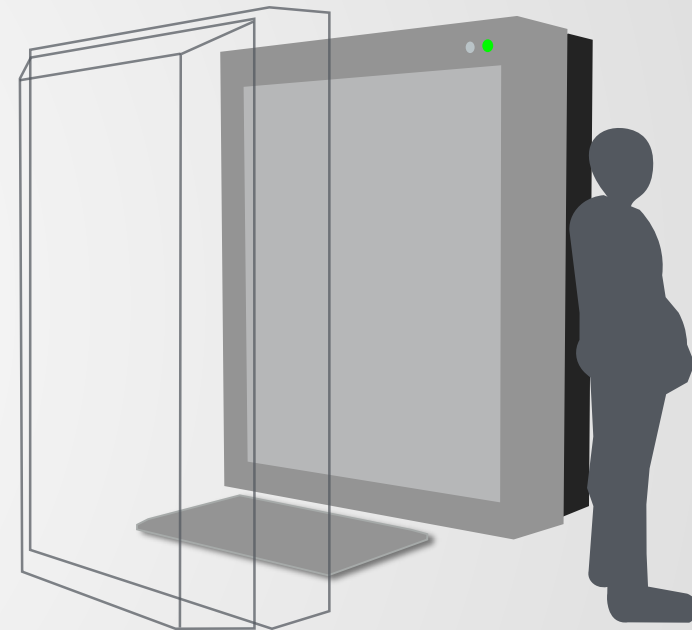
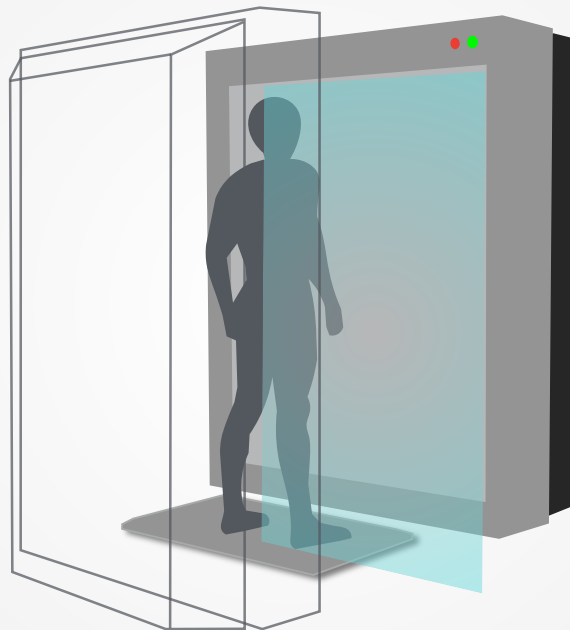
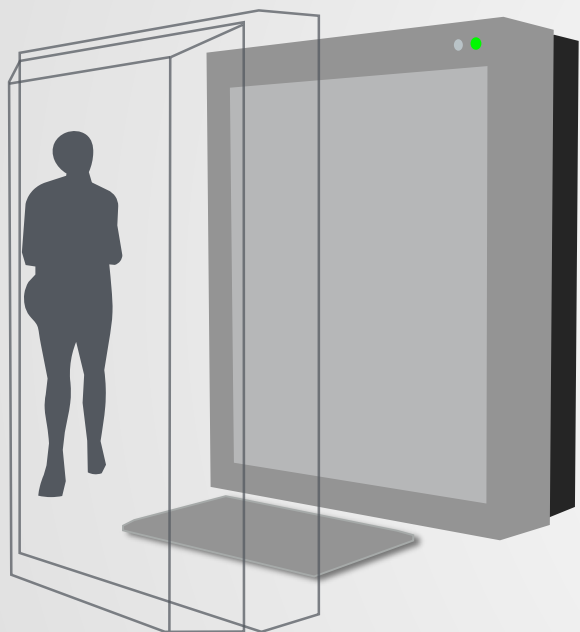


Features

- Open & Non-contact
- Body surface inspection
- Various kinds of contraband
- Ultra low-dose & high resolution
- Various image processing functions
- Sensitive to body sides
- ATR & privacy protection



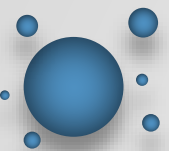
BX Series – Process



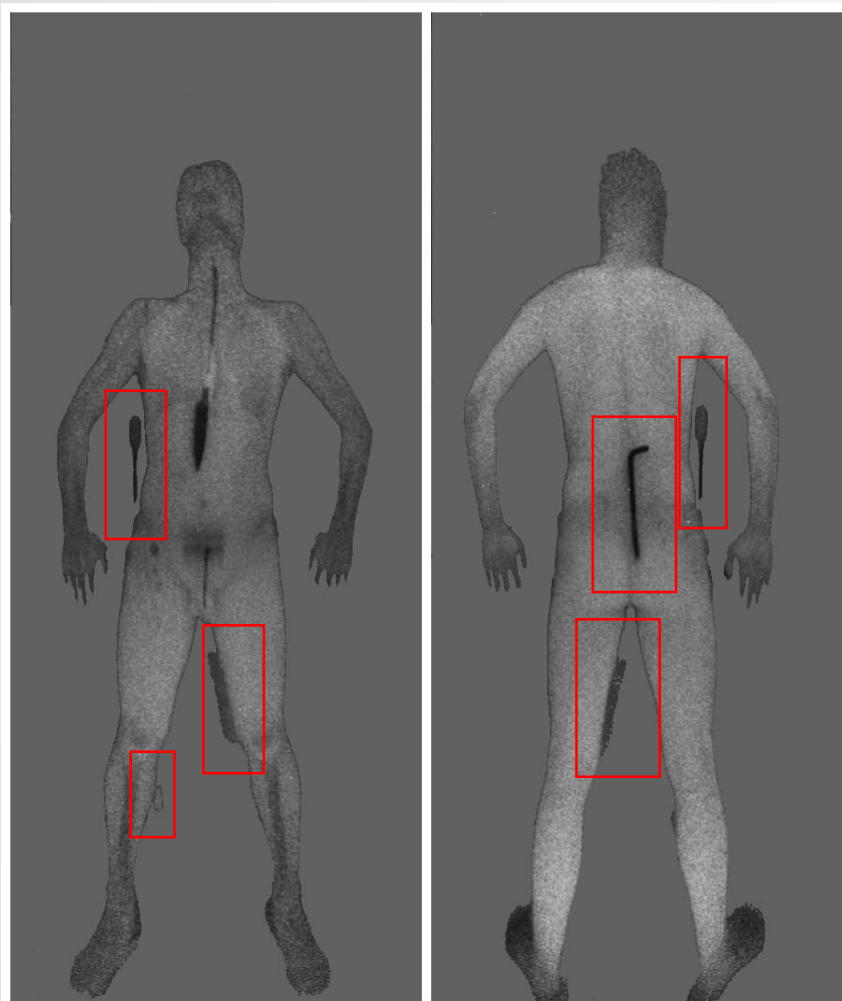
Standby

Scan

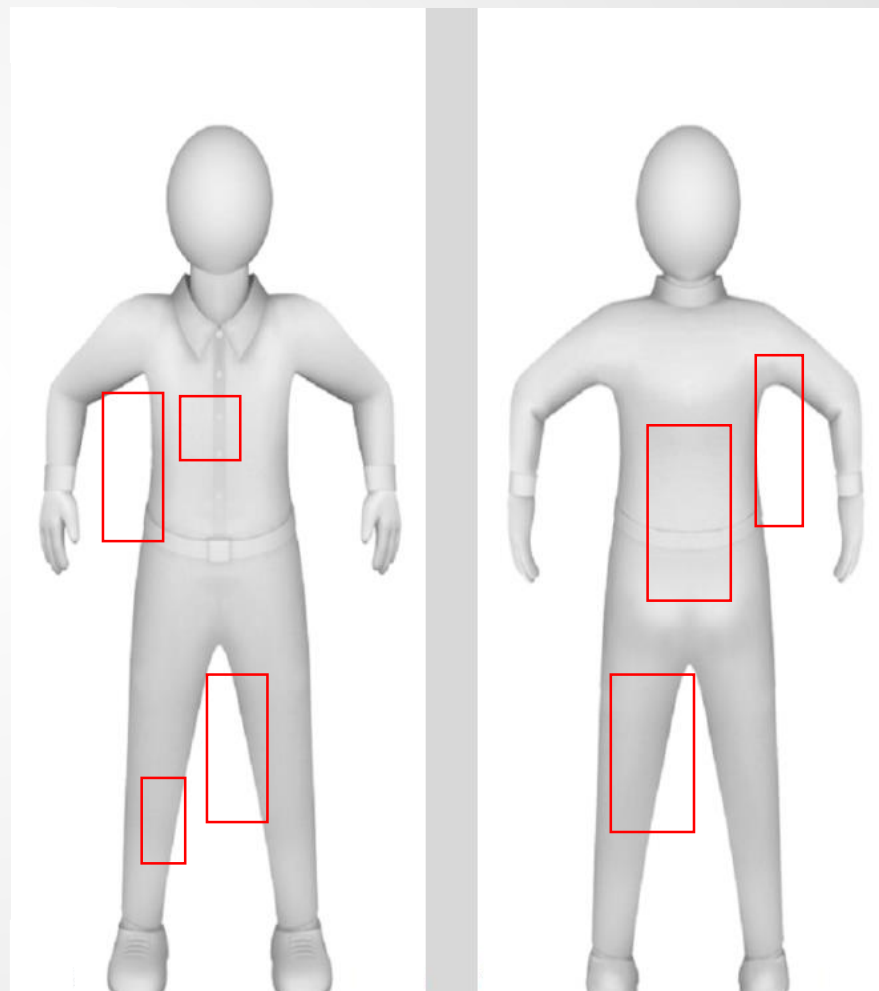
Finish



BX Series – Images with ATR (Automatic Threat Recognition)

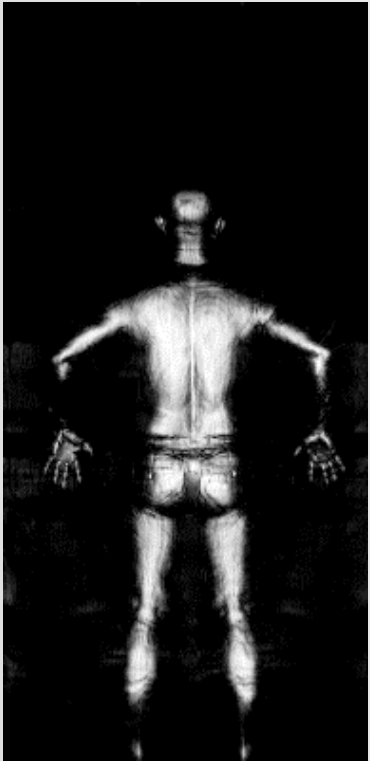


Real images (with automatic threat recognition)

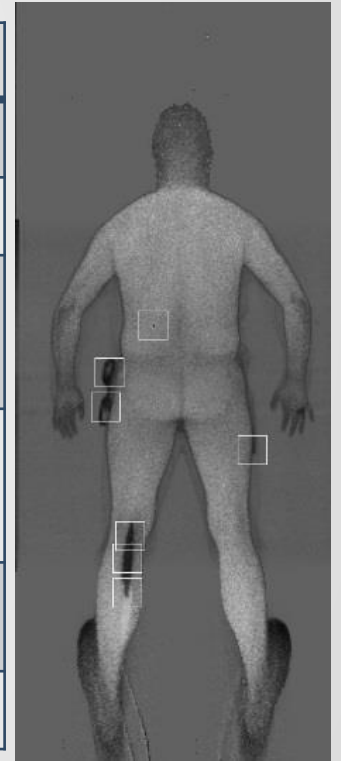


Cartoon images (with automatic threat recognition)

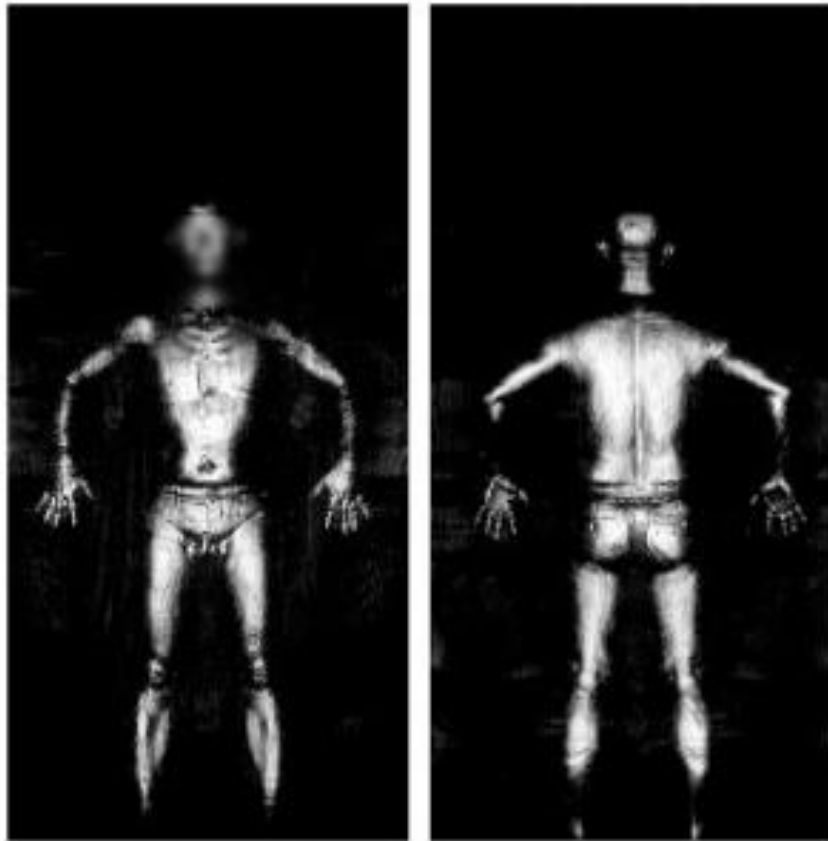
Backscatter X-ray VS Millimeter wave



Millimeter wave body scanner	Backscatter X-ray body scanner
✗ Acceptable image quality.	✓ High image quality
✗ Lower resolution ($\approx 3\text{mm}$)	✓ Higher resolution (0.5mm / 1mm)
✗ Limited ability to penetrate cloths; leather and thick clothing and clothing with metal wires (pieces) must be taken off.	✓ Usually no need to take off cloths.
✗ Vulnerable to interference including sweat and clothing folds, which can cause false alarms.	✓ Strong anti-interference ability.
✗ Less ability to detect contraband on body sides.	✓ Enhanced body-side-contraband detectability due to NuTech technology.
✗ Unable to detect feet	✓ Able to detect feet



Backscatter X-ray VS Millimeter wave



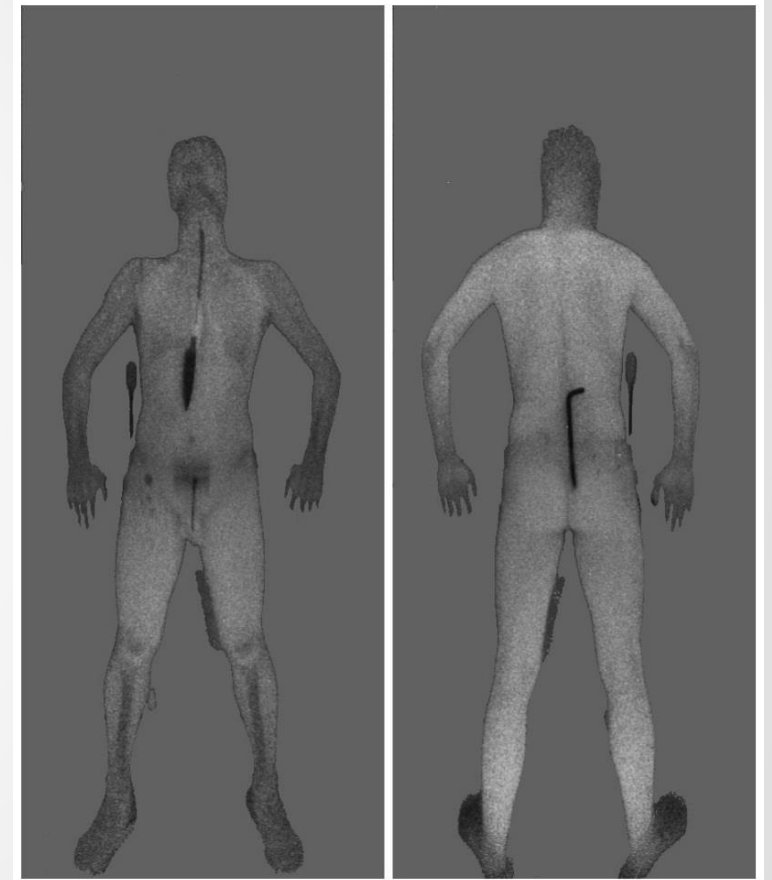
Real image of millimeter wave body scanner

We can find that:

Backscatter X-ray image quality is better than that of millimeter wave image.

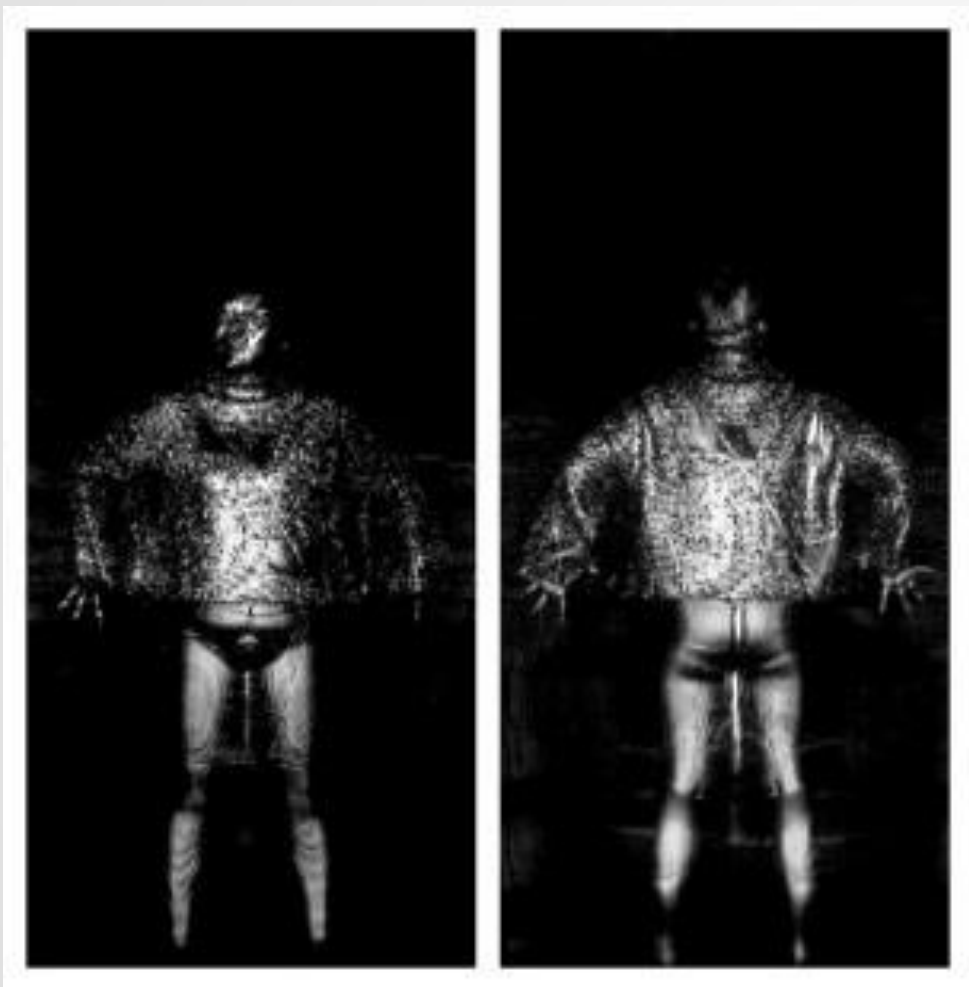
In millimeter wave images, body sides are totally dark. If there are small items or items with low millimeter reflectivity hidden on body sides (like waist sides and knee sides), they are hard to be found.

Millimeter wave image cannot show the feet areas.

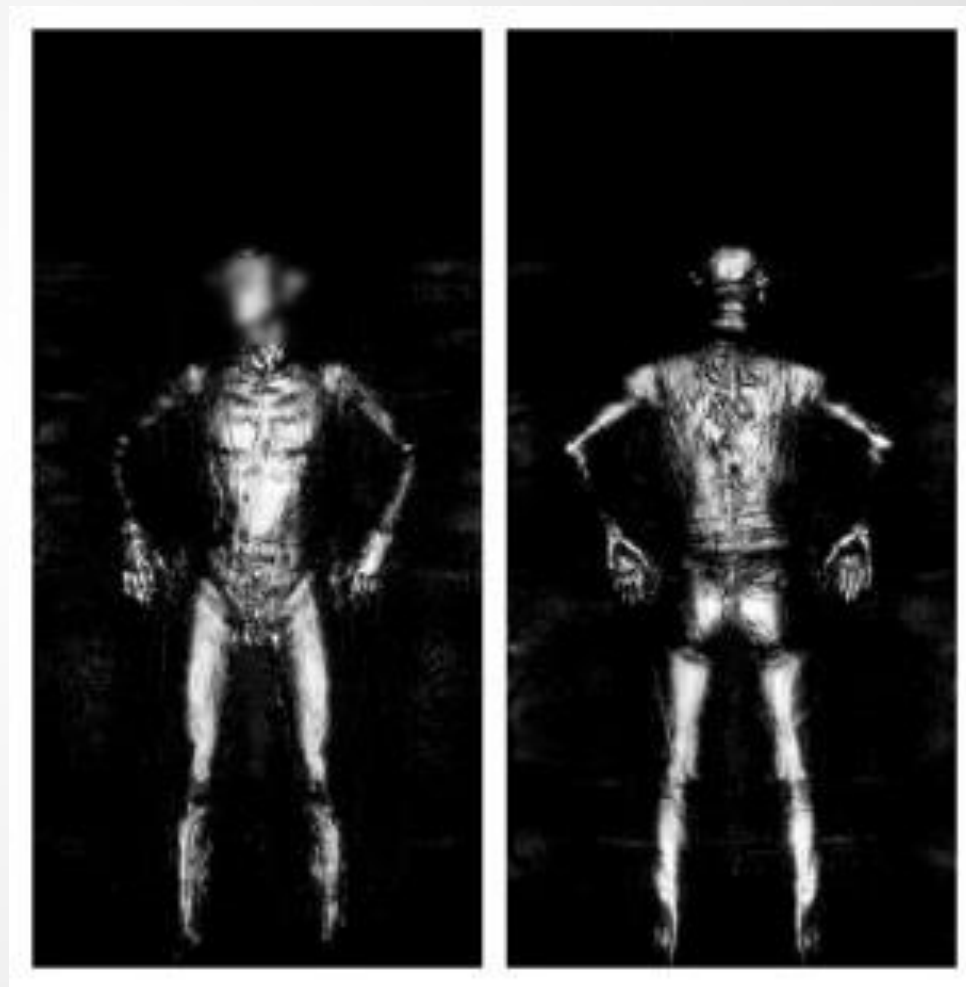


Real image of BX2000DA

Backscatter X-ray VS Millimeter wave



Millimeter wave fails to penetrate cloths with a lot of metal decorations



Back image is disturbed by sweat

BX Series – Applications



Prison



Airport customs

Thanks!