

# Press Release

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## **Breakthrough applications with Flat-Panel Detector Technology**

### **Advanced direct-conversion FPD technology successfully used in Cardiology systems, General Rad rooms and R/F rooms**

Shimadzu, world-wide manufacturer of diagnostic imaging equipment, has introduced Cardiology systems, General Rad rooms and R/F rooms applying 43 x 43 cm (17 inch) flat-panel detectors (FPD) based on direct-conversion technology. For these modalities Shimadzu is developing cutting-edge technologies such as Tomosynthesis, Dual-Energy Subtraction, Slot Radiography and Cone Beam CT. The Shimadzu FPD "Safire" technology offers distinct advantages in image quality and dose efficiency when compared with indirect-conversion flat-panel. The direct-conversion technology creates clearer high-resolution images with less signal deterioration and reduced noise. Several hundred clinical "Safire" installations are already in operation world-wide.

### **Digital Tomosynthesis**

With the introduction of the Safire flat-panel using direct-conversion technology, Shimadzu has opened the road to a wide range of new and revolutionary applications, tomosynthesis being just one example. In tomosynthesis the individual tomographic layers are stacked on top of

each other and digitally compiled to create a volume reconstruction of the region of interest. Up to 90 exposures can be acquired in a single tomographic sweep, drastically reducing the total examination time and burden on both patient and operator. With Shimadzu's 17" (43 x 43 cm) Safire flat-panel detector large regions can be examined with significantly reduced X-ray dose. By incorporating this technology in a multifunctional R/F system, Shimadzu also enables tomosynthesis with patients in the upright position. This is especially useful for examinations of scoliosis or load-bearing joints such as hips and knees.

### **Dual-Energy Subtraction better recognizes pulmonary nodules**

Dual-energy subtraction imaging is often incorporated into new digital radiography systems. This enhanced radiography technique exploits the different physical properties of soft-tissue and bony structures affecting the attenuation of X-ray photons at different X-ray energies. During a single examination a "low-energy image" and a "high-energy image" of the patient are captured. The construction of a pair of "energy subtraction" images is obtained as a working result. One of the major advantages of DES is the clear depiction of calcification, thereby strongly supporting characterization of pulmonary nodules.

### **Cone Beam CT enables precise tumor treatment**

Cone beam computed tomography (CBCT) imaging visualizes vascular tree structures in 3D. It is used in cancer therapy and allows the precise localization of the tumor zones as well as their treatment with optimum dosage. CBCT evaluation shows a 200 % improvement in resolution when compared with current 128 slice CT scanners, while reducing total patient dosage by 90 %.

### **Slot Radiography**

Slot radiography is a technique used primarily for examinations of scoliosis and the lower limbs. Slot radiography enables the acquisition

and reconstruction of so called “long images”, displaying a complete spine or lower limbs. Shimadzu introduces this technique with their multifunctional remote controlled R/F system. During the examination a sequence of 5 cm wide slots is acquired so as to avoid image distortion as a result of the diverging X-ray beam and to reduce scatter and dosage to the patient. After acquisition the individual slots are digitally reconstructed into a long image.



Caption: HeartSpeed with direct-conversion FPD “Safire”.

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