# WFNMB2018 Abstract Submission

*Physics (including instrumentation & dosimetry)*

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## Design and Development of a Dedicated SPECT System for Cardiac Imaging

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**Background / Aims:** Cardiac SPECT imaging have a crucial role in assessing myocardium in patients with suspended coronary artery disease. We designed and developed a dedicated cardiac SPECT system called ProSPECT to cover patients with different sizes. Also, the scanner provides both supine and prone imaging. This dedicated cardiac imaging system introduces an optimized FOV to minimize inappropriate activity uptake of other organs. It should be noted that the system increases comfort patients specially patients with claustrophobia disorder because the head of patients comes out of the bore of gantry during scanning. The aim of this study is to report the design and performance characterization of ProSPECT based on NEMA-NU2 2007 standards for gamma cameras.

**Methods:** The scanner have two perpendicular detectors that are including NaI(Tl) crystal followed by an 4x6 array of square PMTs (76x76 mm). The use of square PMT provides full coverage of the crystal and decreases the dead zone in the detector. A non-linear recursive filter that we were succeed to registered it as US patent is applied in readout electronics of the detector.

**Results:** The proposed scanner has introduced acceptable uniformity (2.5 % integral uniformity and 1.3 % differential uniformity) and linearity (0.8 mm absolute and 0.2 mm differential linearity) in UFOV. The intrinsic and extrinsic spatial resolutions with low-energy high-resolution (LEHR) collimator on the surface of the detector were 3.7mm and 7.5mm, respectively. The energy resolution of the camera was determined 9.3 % and the sensitivity of the system was 180 cps/Mbq.

**Conclusion:** The performance evaluation demonstrated the proposed scanner is appropriate for cardiac imaging. The system is currently under clinical tests.

**Disclosure of Interest**: None Declared