

## Performance measurements of positron emission tomographs with Na-22 point-like source

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### Abstract

We performed the performance evaluation of PET scanners (SET 3000GCT/M and SET 2400W) using a Na-22 point-like source. We measured spatial resolution, sensitivity and uniformity, and compared the results with the NEMA method. In the measurement of the spatial resolution, the Na-22 point-like source was attached to the three-axis orthogonal robot (IAI Corporation). As a result, we could set the source easily, and accuracy of measurement improved. In addition, we could obtain a result more stable than the NEMA method because a shape of the source is constant. Furthermore, it is not necessary to make point-like sources every time and can expect the radiation exposure reduction of the users. Because it was not necessary to use metal sleeves in the sensitivity measurement, the measurement and analysis became simple. However, it is necessary for the Na-22 point-like source to investigate influence out of the field of view. We designed a measurement method of the uniformity using the Na-22 point-like source. The result was slightly more different from F-18 than the method using the cylindrical phantom. It was thought that our method was superior because the Na-22 point-like source was not affected by the scattered coincidence. Na-22 has a long half-life with 2.6 years and it is available for 4-5 years and is useful for cost reduction.