

AbstractID: 3809 Title: Investigate on the deconvolution method to compensate the movement of the object during PET scanning

**Purpose:** The deconvolution method to compensate the movement of the object during PET scanning was investigated. The motion artifact should be removed for exact staging of the patient.

**Method and Materials:** The PET images for movable object with FDG using Biograph(Siemens, USA) were obtained. The FDG drugged small object with 1mm diameter and 5 cm long was installed at the end of the cam of the moving phantom. The profiles for Z-direction, movement direction, including the maximum intensity point, were extracted from the images. The 1-D movement of the phantom was calculated from the physical distance of the moving phantom. The iterative deconvolution method was implemented on the profile obtained from the moving phantom to compensate the movement of the object.

**Results:** The profile from convolution between profile for stationary case and 1-dimensional movement of the scanning object was calculated. The maximum intensity of the stationary case (543,915 bq/ml) was 158% higher than the movable case(343,803 bq/ml). The calculated profile (319,685 Bq/ml) was well agreed with the movable one within 7%.

**Conclusion:** Due to the movement during the PET scanning, the scanning signals are reduced and affect on the maximum SUV, derived from the maximum intensity in the interested region. The movement of the organ should be monitored by given solution such as RPM. The suggested iterative deconvolution method could be implemented on the most movable direction, and it could successfully remove at least 1-dimentional motion artifact.