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CORRECTION METHOD FOR COLLIMATOR EFFECTS OF SPECT. S.Iwata,M.Nakajima(Faculty of science and Technology, Keio Univ., Yokohama) K.Ogawa,A.Kubo(School of Medicine, Keio Univ., Tokyo) S.Yuta(Univ. of Tsukuba, Ibaraki)

The collimator effects of Single Photon Emission CT (SPECT) is one of the important factors which causes to the image quality degradation. This factor depends on the configuration and the materials of collimator inherent in the system, and yields a "shift-variant" blur on the reconstructed image.

Therefore, it is impossible to apply the conventional deconvolution operation to recover the image quality, and the practically effective method to this problem has not developed yet.

However, it is analitically proved that this kind of blur could be tranceformed to a "shift-invariant" form on each concentric circle of the same frequency by shifting our discussion on the frequency space. Then we proposed the new algorithm for improving the quality of image, utilizing the above mentioned characteristics.

We performed the computer simuration to verify the effect of this algorithm, and obtained good results.

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ATTENUATION CORRECTION METHOD FOR SINGLE PHOTON EMISSION C T. T.Morozumi, M.Nakajima(Faculty of Science and Technology,Keio Univ.,Yokohama) K.Ogawa,A.Kubo, S.Hashimoto(School of Medicine,Keio Univ., Tokyo) S.Yuta(Univ. of Tsukuba,Ibaraki)

We developed the new method for Sigle Photon Emission CT (SPECT). This method employs the exact attenuation distribution of the object as an a priori information, and introduces an iterative procedure to correct the effect of attenuation. The several methods for this purpose have ever been proposed, and some of them have already put to practical use. However, they are the methods ignoring the attenuation distribution completely or assuming the uniform distribution within the object outline. Hence, in the case of the application to the parts with a large variation of attenuation coefficient, such as the chest or the abdomen, the good refinement of the image quality is impossible to expect.

The point of feature of this method is that the ratio of two reprojections, the one is calculated under zero attenuation and the other is calculated considering the attenuation, is multiplied by a measured projection data.

Computer simulations have shown that this method is stable and has the excellent effect of attenuation correction in contrast with the conventional methods, especially in condition of a large quantum noise.