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Applied Mathematics for Understanding Photon Counting Computed Tomography（PCCT）

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The noise analysis and its decreasing technology for CT-imaging is very important problem. Especially this basic studies should be applied by using Mathematical analysis, ①the stochastic Process and ②the Logistic Pure Chaos. In this presentation I wish to explain only about ② .

"Logistic Pure Chaos" represents the new fundamental constructed concept that occurs in the dynamical systems of microscopic phenomenon and noise analysis in nature. So this chaos can transfers the relationship between the deterministic and the stochastic variables using the nature analysis.

The nonlinear sequential equation for the Logistic Pure Chaos and those values are the random numbers according to Beta distribution（1/2,1/2). Its mathematical proof can show by using some simple harmonic oscillational model. For Monte Calro Simulation ,it is necessary to generate the white noise that transfers this random numbers. On the other hand, the electronic circuit under the CdTe semiconductor usually generate a lot of noise. This mathematical model may be useful to understand this phenomenon.

Topics

Session D. Biomedical optics and sensors technology

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