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Suggestion on Regularity Index for Gated Therapy by Analyzing of Breathing Pattern

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For precise radiation treatment including IMRT, gated therapy is suggested to reduce the target motion. Monitoring of skin motion using 4D CT with Real time Positioning Management (RPM, Varian, USA) is used to determine a breathing pattern of the patient. The breathing signal obtained by detection of reflected infra-red light from small box located on abdomen of the patient is automatically recorded, and it is used to determine the respiration phase of the acquired CT data. Applying Fourier transform on breathing signal, it could be separated signals from couch movement, signals from heart beating, and signals from respiration. For 10 liver patients and 10 lung patients, the breathing signal was analyzed by using Fourier transform. Analyzing the breathing pattern in frequency domain, regularity of the breathing was determined by using suggested regularity index for candidate of gated therapy.

Keywords : Gated Therapy, Breathing Cycle, Respiration