Automated four-dimensional Monte Carlo workflow using log files and real-time motion monitoring - DTU Orbit (06/12/2018)

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With emerging techniques for tracking and gating methods in radiotherapy of lung cancer patients, there is an increasing need for efficient four-dimensional Monte Carlo (4DMC) based quality assurance (QA). An automated and flexible workflow for 4DMC QA, based on the 4DdefDOSXYZnrc user code, has been developed in python. The workflow has been tested and verified using an in-house developed dosimetry system comprised of a dynamic thorax phantom constructed for plastic scintillator dosimetry. The workflow is directly compatible with any treatment planning system and can also be triggered by the appearance of linac log files. It has minimum user interaction and, with the use of linac log files, it provides a method for verification of the actually delivered dose in the patient geometry.

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