OpenDXMC

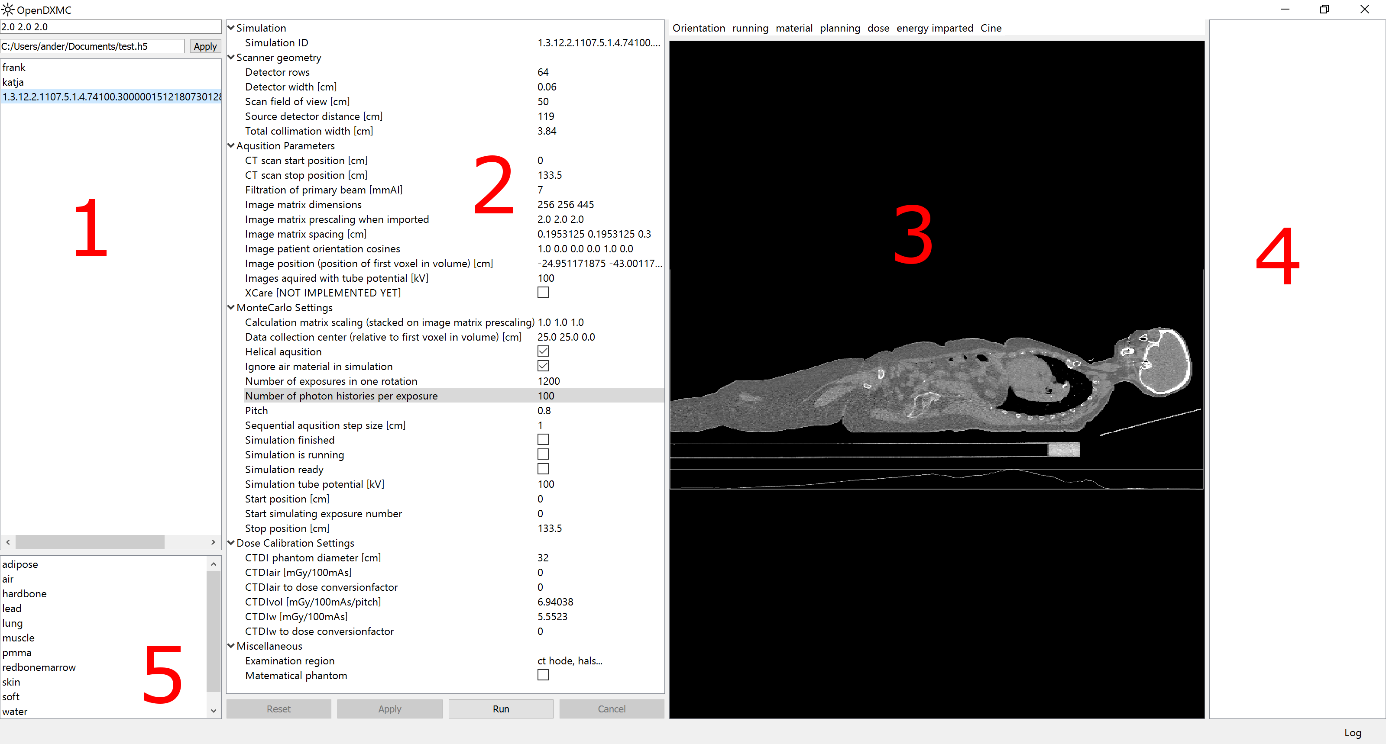
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## Introduction

OpenDXMC is a Monte Carlo application to estimate radiation doses from conventional x-ray and CT examinations. The application consists of a dose scoring library and currently a GUI to easily import and set up dose simulations of CT scans. A GUI to estimate doses from conventional radiographs is planned in the future. Currently the application allows for dose simulations on patient images by importing a CT series, only DiCOM images are supported. In addition, phantoms from the  Virtual Human Database created by [Helmholtz Zentrum research center](http://www.helmholtz-muenchen.de/en/amsd/service/scientific-services/virtual-human-database/) (<http://www.helmholtz-muenchen.de/en/amsd/service/scientific-services/virtual-human-database/>) are supported. The application is still in early development, so there are some issues to be aware of:

* Maximum tube potential to simulate is 150 keV, and limited by the photon spectrum generator.
* No Bowtie filter is currently modelled, if CTDIvol is used to normalize simulated dose the dose will be overestimated. However, CTDIair will give more accurate estimates.
* BUG: After cancelling a simulation the application will not start a new simulation. It will however resume a new started simulation after restart.
* AEC profiles are currently not implemented for digital phantoms.

## Overview of the CT user interface



1. List of imported DiCOM series or phantoms, to import images/phantom drag a folder containing the items into this list.
2. Available simulation and scan properties for the current simulation.
3. Viewport to visualize CT images, tissue material composition, energy imparted and doses. Change orientation by the Orientation button, view through the stack by the mouse scroll wheel. Obtain an image of the current view by dragging from the viewport. To use the Cine function to generate a movie of the current view, [ffmpeg](https://www.ffmpeg.org/) needs to be installed and available from your PATH variable.
4. List of organ doses, this will however only be populated if the simulation is on a digital phantom.
5. List of default materials available, it is possible to add new materials, see the materials chapter.