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Radiation Transport with Monte Carlo simulation

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Monte Carlo simulations of radiation transport are becoming more and more interesting also with respect to the analysis of our cultural heritage. Last generation of the codes relies on more detailed data libraries related to both heavy and light particles, covering a larger portion of elements and isotopes. The codes are able to manage extremely detailed geometries based not only on standard 3d surfaces/volumes (constructive solid geometry approach), but also on FE description enhancing coherence with the outcome of advanced technologies like CT scans, with increased performances thanks to the computational possibilities offered by code's massive parallelisation. This evolution allows also an unprecedented capability analysis in terms of detector response qualification through more efficient variance reduction techniques.

Learning outcomes: Starting from that, an attempt will be made to illustrate how this approach could be practically implemented and formalised within a fully digital environment for some paradigmatic problems in the cultural heritage field.