

Scientometrics of Monte Carlo simulation: lessons learned and how HEP can profit from them

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An extensive scientometric assessment of the literature is presented, which documents the prominent role achieved by Monte Carlo methods, and simulation in general, in particle physics and related fields (nuclear physics, astrophysics, medical physics etc.). As an example of their pervasiveness, one can remark that currently approximately 50% of the papers published in major, multi-disciplinary nuclear technology journals mention simulation methods. Scientometric data evidence their use not only in traditional academic research domains, but also in industry, hospitals and other disciplines not directly related to high energy physics.

The analysis of scientometric data identifies some relevant features related to Monte Carlo methods and codes: it quantifies their impact on HEP itself, on scientific communities other than HEP, on industry and on social aspects of life sciences. Both widely used, general purpose Monte Carlo codes and specialized codes that address specific needs or user communities are examined.

The presentation highlights the contribution of HEP to this scientific domain, and discusses how the HEP community could profit from these achievements by improved communication methods addressed to the civil society, to funding agencies and to government bodies.