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Computational tools II

Saturday 30 September 2023 09:45 (1 hour)

Numerical Methods and Computational Tools" aims to outline good practices in scientific computing and guide the novice through the multitude of tools available. This lectures aim to clarify important aspects of numerical computing to help avoid making bad but unfortunately common mistakes. We describe the most critical aspects associated with numerical computing with a finite precision floating-point representation of real numbers. Given the indispensable role of computers in the daily life of a scientist, numerical stability is essential knowledge for every modern scientist. In this first lecture, we suggest also reference readings and explain through examples the importance of well-designed and well-chosen numerical methods and algorithms. The second lecture provides pointers to established resources and describes the main tools available for scientific computing. We explain which tool or solution should be used for a specific purpose, dispelling common misconceptions. We also outline the most common tools for designing and optimising particle accelerators, whether they are rings or linacs. Also, we will unveil powerful shell commands that can speed up simulations, facilitate data processing, and increase your scientific throughput. We will exclusively refer to free and open-source software running on Linux or other Unix-like operating systems.

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