Grid Computing: a new tool for Science and Innovation

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Grid Computing for Hadron Therapy Studies

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Irradiation with photons and electrons is a commonly used technique for curative or palliative treatment of malignant tumours for since many years. Clinical treatment with proton and ion beams as a promising radio-therapeutic modality has been explored during the last 60 years: protons were first clinically used in humans in the 1950s, therapies using light ions have their origin in 1975. In Europe several new facilities for hadron therapy have been constructed or are foreseen to become operational in the next years.

Examples of such facilities are CNAO in Italy, where the first patient should be treated in 2010, and MedAustron in Austria, which plans to start operation in 2012.

Monte Carlo simulations are a useful tool to study source and target (phantom) configurations. These techniques complement treatment planning system based on parametrization and allow to perform precise scientific studies. They can also play a special role during commissioning of a facility, providing input for the configuration and operation even before the first beams are available.

Detailed simulations require significant computing resources. As the simulations can be performed in long running jobs, which are independent, a grid infrastructure is well suited for these task. In Austria such simulations have been performed using the Ganga toolkit, which provides the researcher with a easy to use interface. Also the DIANE Distributed Analysis Environment has been used to improve the resource management for computing intensive tasks. Other grid based activities in the European context will be also presented.

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