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The proton and carbon therapy experience of the medical physics group at the Italian Southern Laboratories: Monte Carlo simulation and experiment G.A. PABLO CIRRONE, C. AGODI, G. CANDIANO, G. CUTTONE, F. DI ROSA, E. MONGELLI, P. LOJACONO, S. MAZZAGLIA, G. RUSSO, F. ROMANO, L.M. VALASTRO, INFN-Laboratori Nazionali del Sud, Catania (I), S. LO NIGRO, Univ. of Catania (I), S. PITTERA, CSFNSM Catania (I), M.G. SABINI, A.O. Cannizzaro, Catania, L. RAFAELE, V. SALAMONE, A.O. Policlinico, Catania (I), C. MORONE, 2nd Univ. of Rome (I), N. RANDAZZO, V. SIPALA, INFN Section of Catania (I), M. BUCCIOLINI, M. BRUZZI, D. MENICHELLI, Univ. of Florence — At the Italian Southern Laboratories (LNS) of the Italian National Institute for Nuclear Physics the first, and actually unique, Italian proton therapy center is installed and operating. Up to now, 140 patients have been treated. In this environment a big effort is devoted towards Monte Carlo simulation especially with the GEANT4 Toolkit. The authors of this work belong to the Geant4 Collaboration and they use the toolkit in their research programs. They maintain a Monte Carlo application devoted to the complete simulation of a generic hadron-therapy beam line and take active part in the study of fragmentation processes. Moreover they are working in the development of a prototype of a proton Computed tomographic system. In this work we will report our results in the field of proton and carbon therapy either in the simulation as well in the experimental side of our activity.

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