

The CNAO accelerator – *M. Pullia, CNAO*

The CNAO (the National Centre for Oncological Hadrontherapy), in Pavia, is the first Italian center dedicated to deep hadrontherapy. Three treatment rooms with four beam ports (three horizontal and one vertical) are fully equipped and one experimental room is available for further developments. Proton beams with kinetic energies up to 250 MeV and carbon ion beams with maximum kinetic energy of 400 MeV/u are transported and delivered by active scanning systems. Two ECR sources are operated in parallel to allow fast switching between ions. They are followed by a low energy transfer line that allows selection of the particle type and leads the beam to a common linac that increases the particle energy to 7 MeV/u. The beam is then injected into the synchrotron with a multi-turn scheme, it is accelerated to the extraction energy and it is finally extracted with a resonant slow extraction scheme.

The machine commissioning started in 2009 and by September 2011 the first patient was successfully treated. Treatments with carbon ions will start in the next weeks.