

# A proton minibeam setup in the TPBL and the MIRO project

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Minibeam irradiation is seen as a new frontier for exploiting the advantages of proton beams, as well as other types of radiation, towards increasing the therapeutic ratio on clinical treatments. In this context a novel INFN project has been recently launched called MIRO - Minibeam Radiation, dedicated to the investigation of beam design and radiobiological effectiveness of electron and proton minibeam irradiations. The first part of this project carried on at the Trento proton beam Laboratory (TEPBL) was the setup of a dedicated line for irradiation through a specific collimator, which, being able to serve both for protons (70 MeV) and electrons could allow a link between the local investigations and those performed with electrons in Pisa. This first setup was firstly characterised by extensive simulations and then used for experimental measurements through EBT films. The agreement between simulation and measurements was very promising and it was possible realised a peak to valley dose ratio (PVDR) uin the setup, larger of 3.5, uo to 5 mm depth after the collimator, thus allowing in principle irradiation of biological samples in the range relevant to mini beam radiobiology research. Further design of more opimized collimators is also proposed, through dedicated simulations.

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