Abstract

Principle design elements of the radiation protection systems of the ELI-ALPS (**E**xtreme **L**ight **I**nfrastructure-**A**ttosecond **L**ight **P**ulse **S**ource)

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The recent 20 years the laser technology started increasing rapidly, the plans for the near future is to achive the PW range and the intensitiy of 10^{21} W/cm^2. The European Comission has a plan to build the ELI (Extreme Light Infrastructure) to investigate the laser-matter interactions. The ELI will settled in three sites (Czeh Rebublik, Hungary, Romania).

Not only the laser light, but the secondary (proton, electron) sources by the so called TNSA effect will be also extreme at the ELI. We will have to handle this beams somehow to avoid the harms, that these beams can cause. To design the radiation protection, first of all we have to understand the processes and the interactions that occours at the ELI. The solution is to design and build a so called beam dump to stop these secondary sources. The radiation protection systems have to satisfy the internatinal (IAEA, ICRP, ICRU) and national standards, laws.

To design the beam dump and the thickness of the experimental walls, the Fluka monte carlo code is the best solution, the simulated and measured values are very similar. The three ELI site beam dumps are compared, a so called in situ approximation calculation method is demonstrated by several parameter sensitivity analises.