Muon Collider Targetry Workshop
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Experience with High Flux Targets - Summary of presentation

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The AA/ACOL antiproton production target received 26 GeV proton beams of around 1 x 10^{13} protons per pulse at a repetition rate of 0.42 Hz (i.e. 1/200 of the mean power of the proton driver for the pion production target)

AA/ACOL production targets. The AA/ACOL target/Li-lens assemblies are shown in the first 4 transparencies. This ACOL target incorporated several years of R&D studies, some resulting in catastrophic damage. The target lifetime of this version (from 1988 onwards) was effectively unlimited.

The Mercury Jet target. This was a laboratory experiment to test the feasibility of liquid jet targets. Some constructional details are presented together with computer enhanced photographs of the experiment - 4 transparencies. REXCO hydrodynamic shock simulations of a proton beam hitting a mercury target, i) contained within a stainless steel tube, and ii) in the form of a jet in vacuum, have been worked up from hitherto neglected runs by A. Poncet and are presented - 3 transparencies.

Radioactivity and radiation issues. With high-flux targetry comes the problems of radiation damage and induced activity. A great deal of effort went into studying and documenting our experience - mainly the work of A. Sullivan. Our empirical formulae have been applied to the pion production target and capture solenoids - 3 transparencies.

Slurry jet targetry. This turns out to be more difficult than I had imagined. High-density slurries are very viscous due to effects at the microscopic level: irregular grain shapes and grain-to-grain bonding. A relatively low-viscosity slurry was achieved by mixing WSe_2 with water, but the density was no higher than 4 g cm^{-3} - 1 transparency.