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A new construction technique of high granularity and high transparency Drift Chambers for modern High Energy Physics experiments

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Modern experiments for the search of extremely rare processes require high resolutions (order of 50-200 keV/c) tracking systems for particle momenta in the range of 50-300 MeV/c, which is totally dominated by multiple scattering contributions.
We present a newly developed construction technique for ultra-low mass, high granularity Drift Chambers fulfilling this goal. It consists of:
• a semiautomatic wiring machine with a high degree of control over wire mechanical tensioning (better than 0.5g) and over wire positioning (of the order of 20μm) for simultaneous wiring of multi-wire layers;
• a contact-less IR laser soldering tool designed for a feed-through-less wire anchoring system;
• an automatic handling system for storing and transporting the multi-wire layers to be placed over the drift chamber end-plates.
These techniques have been successfully implemented at INFN-Lecce and University of Salento and are currently being used for the construction of Drift Chamber of the MEG (μ⟶e+γ) upgrade experiment

Collaboration

Meg

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