From Mark3 to Super Babar

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Here follows the abstract:

Gas Tracking detectors traditionally consist of stacked layers of drift cells. The ionization electrons, generated by a charged particle crossing the gas volume, are collected and amplified by the sense wires. The electric field is generally maintained by closed configurations (typically a cylindrical or rectangular tube), or by field wires placed at the edges of a lattice (as in large drift chambers).
To optimize resolutions, both spatial and dE/dx, the gas mixture used is such that the ionization clusters are densely created along the charged track, thus resulting in a signal well defined in time and dominated in amplitude by Landau fluctuations only. Spatial resolution is limited by the primary ionization statistics at small impact parameters and by electron diffusion at large drift distances.
The illuminated example of the multi-wire drift cell of Mark3 will be illustrated as a breakthrough of a new generation of drift chambers in early 80's.
Progress in the development of tracking devices continues with the introduction of extremely light gas mixtures, as the one used for the largest drift chamber ever built for the KLOE experiment at LNF.
Finally, it will be shown that, by collecting on the sense wire all primary ionization and recording the drift times and amplitudes of all individual ionization electrons, spatial resolution and particle identification can be pushed to their theoretical limits of accuracy. Such a drift chamber will prove to be ideal for colliders like SuperBaBar, where accuracies of the order of a few percent in dE/dx are required for particle identification, or like the Linear Collider, where the momentum resolution is needed at the level of a tenth of a percent for 100 GeV/c particles.