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The Ring Imaging Cherenkov Technique and the MWPC as a Photoelectron Detector

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The ring imaging Cherenkov (rich) technique utilizing electron drift over long distances and MWPC as a two-dimensional photo electron detector has been extensively developed during the last years.
A review of the MWPC constraints and the solutions which have been tested will be given using as an illustration the barrel rich of the LEP-Experiment DELPHI.

A prototype has been built and tested (maximum drift length: 1,7m) - latest results on the merit factors N_0 and the Cherenkov angle resolution for both liquid and gas radiators will be discussed.

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DRIFT CHAMBERS WITH DELAY LINE READOUT OPERATED IN THE LIMITED STREAMER MODE.

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A drift chamber with 10 cm drift has been developed and successfully operated in the limited streamer mode. Position sensing along de 4.4 m long anode wire is achieved through delay line timing. The important pulse height of the streamer signals allows the use of slower and usually more absorbing delay lines. Lines of inverse velocity around 600 ns/m are used. A position resolution of better than 1 mm in drift and 3 mm along the delay line are achieved over a surface of 20 x 440 cm^2 with only three timing channels. This "streamer drift chamber" constitutes the unit cell of the forward muon detector of the DELPHI experiment. This detector consists of 16 "quadrants", each covering an area of about 4,4 x 4, 4 m^2 and constituted of 2 layers of 22 chambers each with anode wires crossed at right angles. Results will be presented of tests with individual drift chambers concerning efficiency, position resolution, rate limitations and gas mixtures suitable for streamer operation. First results about the operation of a complete quadrant will also be reported.