# Aging in the Central Jet Chamber of H1

**(title assigned)**

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The track detectors of the H1 experiment are in operation since 1992 at the HERA *ep* collider. Various aging effects which have been observed in the period 1993 – 1997 in the Central Jet Chamber of H1 (CJC) are described.

**Summary of Talk:** The track detectors of the H1 experiment are in operation since 1992 at the HERA *ep* collider. In the central region charged particle tracks are measured with two cylindrical jet drift chambers which are mounted concentrically around the beam pipe. The inner ring, CJC 1, has 24 layers of sense wires strung parallel to the beam axis and covers the radial range $20 < r < 45$ cm, whereas the outer ring, CJC 2, consists of 32 layers covering the range $53 < r < 85$ cm. For most of the running period from 1992-1998 an Argon/Ethane 50:50 gas mixture with 0.1% $H_2O$ as additive was used. Both CJC rings were connected to the same gas circuit. Already after the first few month of operation at HERA a number of wires broke in CJC 1. In total, 48 wires broke in CJC 1 over a period of 7 months while no damage was observed in CJC 2. Corrosive remnants from the gilding process were found on the crimp parts of CJC 1 which induced brittle fracture of the tungsten wires. After changing the design and manufacturing process of the crimp parts of CJC 1 the chamber was rewired in the shutdown 1993/94. Starting in 1996 a significant degradation of the performance in the lower part of CJC 2 was observed. By the end of 1997 a local gain drop of up to a factor of 4 had developed showing a clear dependence on the height of the affected sense wire in CJC 2. Investigations of several of those wires with an electron microscope revealed a correlation between deposits observed on the wires and the measured gain loss. As a consequence all sense wires in CJC 2 have been replaced in the shutdown 1997/98. Another problem occurred in 1998/99 when HERA was operated with electrons instead of positrons leading to increased background levels in the H1 interaction region. In several cells of CJC 1 and CJC 2 higher chamber currents started to develop which after some time led to local HV instabilities, most likely due to the Malter effect. By replacing 0.1% $H_2O$ with 0.8% Ethanol as additive most of the affected regions could be recovered and behaved normally afterwards.