Classical Aging - Short Summary - Part 1-

General Comments:

- either brand new active devices or intended for future experiments
- systematic aging studies done prior to building the full system (not BaBar)

Specifics:

- expected accumulated doses per year
  - 500 mC/cm HERA-B
  - O(100 mC/cm) ATLAS, CMS
  - ~0.3 nA/cm wire (~ 3 mC/cm/10^7s); test chamber ≤ 25 nA/cm wire (BaBar)
- HERA-B and ATLAS use CF_4 based gases (speed)
- BaBar: He-Isobutane (80:20)
- CMS: Ar-DME (50:50) or Ne-DME (50:50) (MSGCs)

Classical Aging - Short Summary - Part 1-

Specifics continued:

- various aging effects observed in R&D
- Malter effect
  - anode aging (depositions)
  - permanent dark currents
  - anode etching
  - Si-polimerization
- lessons learned:
  - aging effects particle source dependent (HERA-B)
  - don't use CH_4, undefined surfaces; restrict unknown materials (ATLAS, HERA-B)
  - avoid Si at all cost (ATLAS)
  - keep H_2O below 1,000 ppm (ATLAS)
  - H_2O, methylal, 2-propanol all help cure Malter effect (classical remedies)
  - O_2 treated chamber runs stably even after O_2 removal! Chamber repair gas? (BaBar)
- radiation hardness exceeding 2,000 mC/cm (HERA-B, ATLAS) achieved