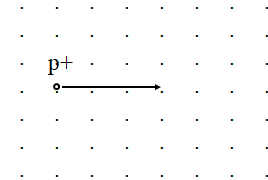
**Noteguide for Particles in a Magnetic Field - Videos 20C Name**

Recall

F = IlBsinθ

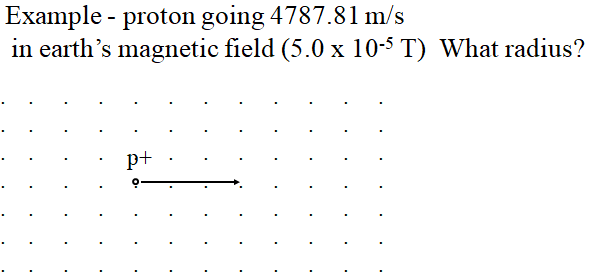
Derive

F = qvBsinθ

* + F = force on moving particle
  + q = charge on particle (in C) (+ or -???)
  + v = particle’s velocity
  + θ = angle twixt v and B

Whiteboards

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| --- | --- |
| 1. What is the force acting on a proton moving at 2.5 x 108 m/s to the North in a 0.35 T magnetic field to the East? (1.4 x 10-11 N, Downward)  q = 1.602 x 10-19 C | 2. What magnetic field would exert 1.2 x 10-12 N on an alpha particle going 17% the speed of light?  alpha = 2p2n (0.073 T)  q = 2(1.602 x 10-19 C) = 3.204 x 10-19 C  v = 0.17x3.00 x 108 m/s = 5.1 x 107 m/s |



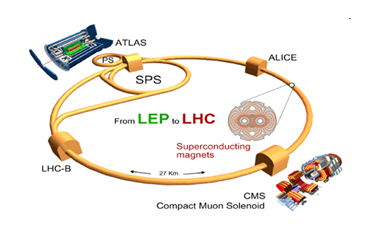
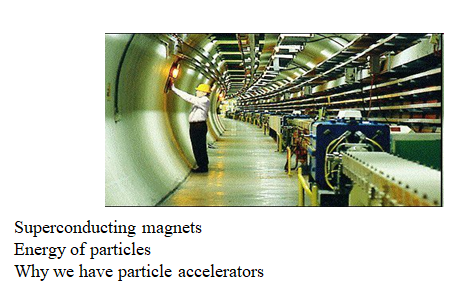
Whiteboards

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| --- | --- |
| 1. If the electron is going 1.75 x 106m/s, and the magnetic field is .00013 T, what is the radius of the path of the electron? (7.7 cm)  m = 9.11 x 10-31 kg  q = 1.602 x 10-19 C | 2. What B-Field do you need to make a proton going 2.13 x 107 m/s go in a 3.2 cm radius circle ACW in the plane of this page? (7.0 T into the page)  m = 1.673 x 10-27 kg  q = 1.602 x 10-19 C |

Whiteboards: (Try to predict the direction they curve - remember electrons go opposite)

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Particle Accelerators:

The Aurora Borealis: (Northern Lights)

