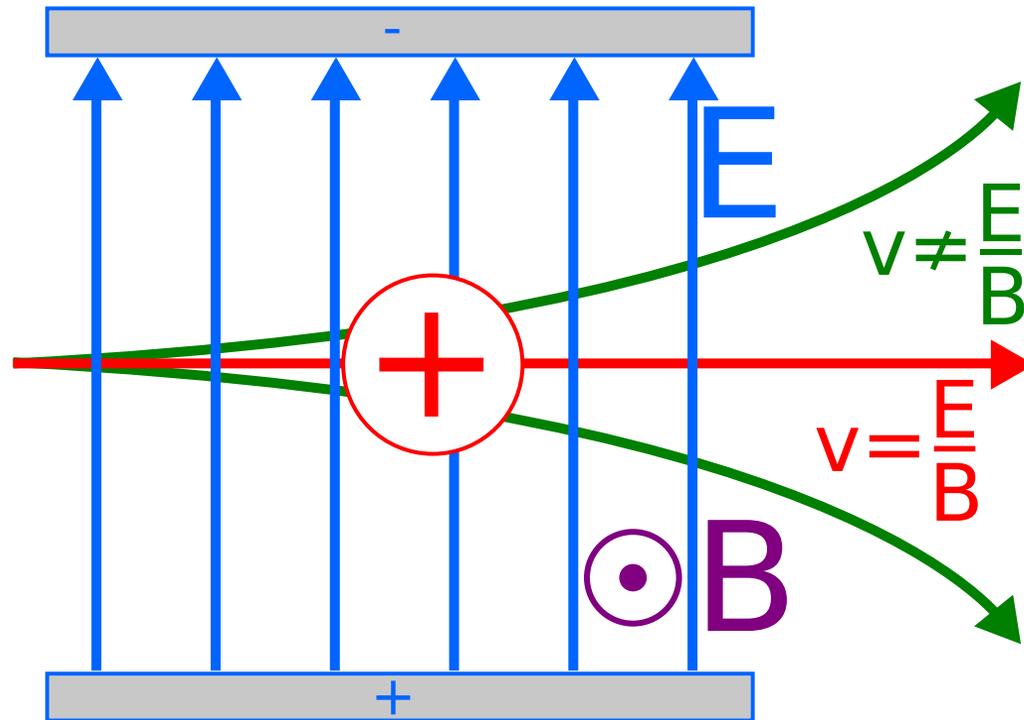


WP6 meeting, 21/11/2023

J. Pasternak, IC/RAL-STFC

Wien filter



- Wien filter is needed for Phase 1 if focusing would be based only on magnetic field
- In that case particles with the same magnetic rigidity (for example, 15 MeV protons and ~ 3.8 MeV/n $^{12}\text{C}^{6+}$) would have the same beam dynamics and cannot be distinguished
- In a Wien filter magnetic and electric fields are combined to have no effect on the proton beam, but although the magnetic force on carbon ions will be the same the electric one will be different

From Wikipedia

LhARA Wien filter parameters (preliminary)

- Parameters
 - 30kV,
 - 3.2cm gap,
 - 0.016T B field
 - hard-edge length 0.7m
 - physical length ~0.8m
- It could be placed just upstream of the 6th solenoid in the long drift between the doublets.
 - If there is no room in the current baseline, the wall would need to be located between solenoid 2 and 3
 - The first superlens consisting of two Gabor lenses would need to be replaced by two separated solenoids (no problem)
- It would be effective for Carbon and Aluminium
 - Need to check other ions: He and Li