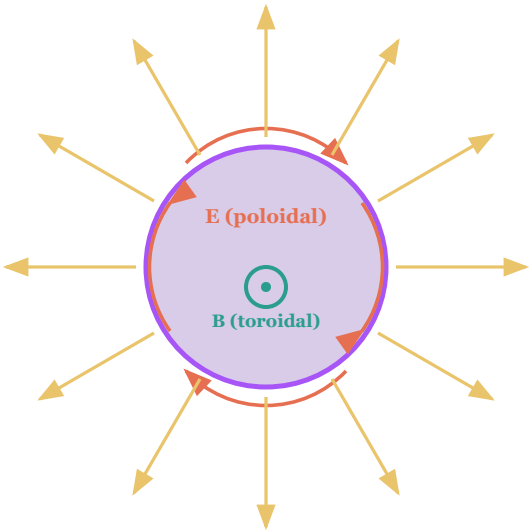
ELECTRON

H = ±1



External E-field
(Coulomb: 1/r²)

Q = ±e

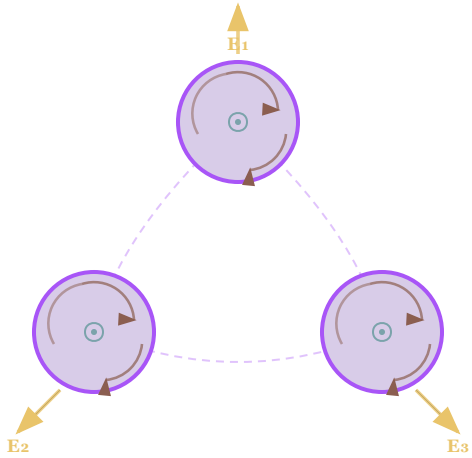
Charged ☐ Detectable

E and B fields LINKED

VS

DARK MATTER

H = 0 (trefoil knot — 3 lobes)



At distance r ☐ R:

Σ = 0

3-fold symmetry ☐ E-field contributions cancel

Q = 0 (Net E = 0 at distance)

Neutral ☐ Invisible to EM detection

The Hopf linking number H determines charge:

H = 0 ☐ knot symmetry ☐ E-fields cancel at distance ☐ no net charge ☐ invisible to EM experiments ☐

Figure 4: Cross-section comparison — Electron (H = ±1) has external Coulomb field; Dark matter (H = 0): 3-fold knot symmetry causes E-field cancellation at distance