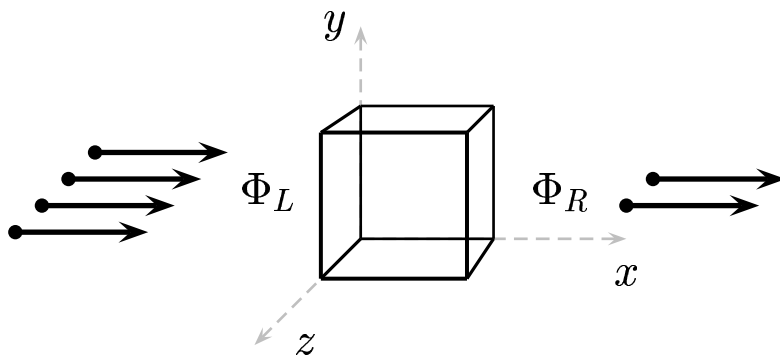


Consider the space of a cubic box.
The Electric field is parallel to the x -axis.
Flux entering from left: $|\Phi_L| = 4 \text{ N m}^2/\text{C}$.
Flux leaving from right: $|\Phi_R| = 2 \text{ N m}^2/\text{C}$.



Find Q_{encl} , the net charge enclosed.

- A) $Q_{encl} = 4 \epsilon_0$
- B) $Q_{encl} = 2 \epsilon_0$
- C) $Q_{encl} = -2 \epsilon_0$
- D) $Q_{encl} = -4 \epsilon_0$
- E) $Q_{encl} = 0$

Gauss's Law states that $\Phi_S = \frac{Q_{encl}}{\epsilon_0}$.

Here Φ_S is the flux leaving the cubic region.

$$\begin{aligned} \frac{Q_{encl}}{\epsilon_0} &= \Phi_S \\ &= -|\Phi_L| + |\Phi_R| \\ &= -4 + 2 \\ &= -2, \quad \text{so} \\ Q_{encl} &= -2 \epsilon_0. \end{aligned}$$

Answer **C**.