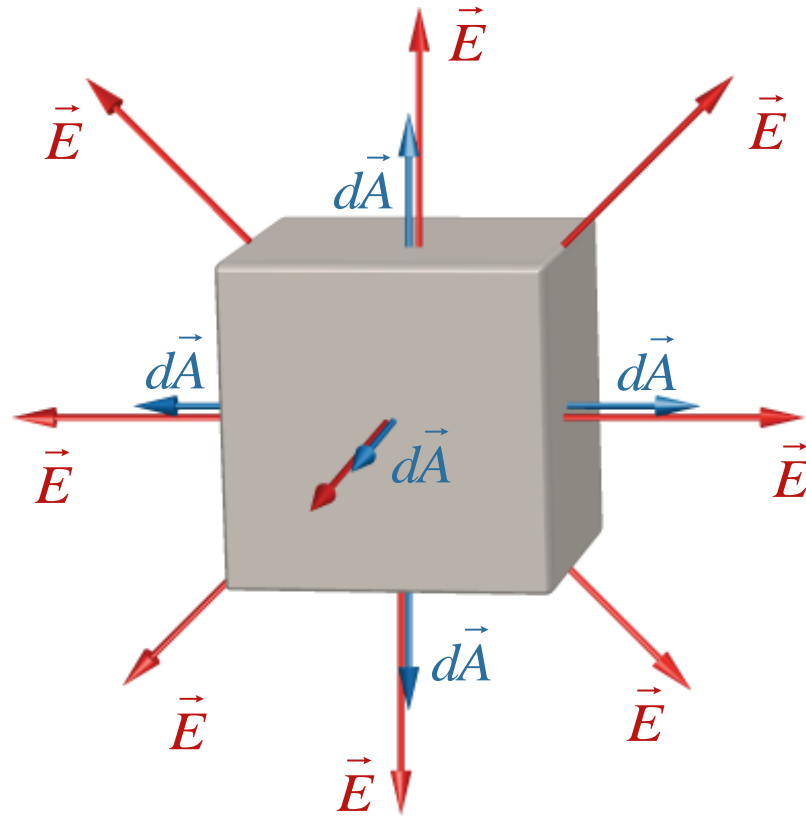For a closed surface, $d\vec{A}$ points outward

$$\Phi_S = \int\limits_S \vec{E} \cdot d\vec{A} > 0$$