

# Griffiths Electrodynamics: Problem 5.19

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One of the properties of steady currents  $\mathbf{J}$  is that they do not diverge  $\nabla \cdot \mathbf{J} = 0$ . This means that  $\int \mathbf{J} \cdot d\mathbf{a}$  is independent of any surface, therefore, *it does not matter what surface you use.*