$$\text{magnetic current } j^{\mu} = \varepsilon^{\mu\nu}\,\partial_{\nu}\,\varphi$$

$$\text{finite energy } j^{\mu} \underset{x \rightsquigarrow \infty}{\rightsquigarrow} 0$$

$$\text{conserved } \partial_{\mu}\, j^{\mu} = 0$$

$$\partial_{\mu}\, j^{\mu} = \partial_{\mu}\,\varepsilon^{\mu\nu}\,\partial_{\nu}\,\varphi = \underbrace{\varepsilon^{\mu\nu}}_{\text{asym}}\,\underbrace{\partial_{\mu}\partial_{\nu}\varphi}_{\text{sym}} = 0$$

$$\text{magnetic charge } \mathcal{J} = \int_{\mathbb{R}^d}^{dx} {}^{t:x} j^{0} \backsim \int_{r\,\mathbb{B}_d}^{dx} {}^{t:x} j^{0}$$

$$\text{conserved } \partial_{0}\,\mathcal{J} = 0$$

$$\partial_{0}\,\mathcal{J} \backsim \partial_{0} \int_{r\,\mathbb{B}_d} j^{0} = \int_{r\,\mathbb{B}_d} \partial_{0}\, j^{0} = -\int_{r\,\mathbb{B}_d} \partial_{m}\, j^{m} = -\int_{r\,\mathbb{S}_{d-1}} d\,S_{m}\, j^{m} \underset{j^{m} \rightsquigarrow 0}{\rightsquigarrow} 0$$