## Classical gauge theories on E-manifolds

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Abstract:

We extend the formalism of vector bundles, principal bundles and principal connections to E-manifolds, which can be used to describe singularities in the configuration space of a classical particle. Manifolds with boundary or corners are configuration spaces naturally described in terms of E-manifolds extending that of b-manifolds. We show the existence of a universal model for the phase space of a particle interacting with a gauge field; in this new setting, Wong's equations become hamiltonian. We see that the universal E-symplectic spaces of Weinstein are symplectic leaves of a bigger universal Poisson space.