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Geometry of EFTs (15'+5')

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Lagrangian terms of an effective field theory (EFT) are commonly organized as an expansion in terms of the EFT power counting. Field space geometry reorganizes these terms in a more efficient way, allowing the direct generalization of some known results to a resummed tower of operators containing higher-order terms, such as the renormalization group equations at one- and two-loop order, some scattering amplitudes, decay widths and electroweak precision observables.This geometric approach also gives a basis independent formulation which can be interpreted with different EFT power counting parameters, helping us select the most appropriate EFT (with faster convergence) for phenomenology studies, such as the Standard Model EFT vs the Higgs EFT.
The purpose of this proposal to the LHC EFT working group is twofold:
1) Fully generalize the formalism to arbitrary EFTs by including derivative terms and particles of higher-spin (fermions and vectors). Ideas to deal with the former include Lagrange spaces and jet bundle geometry, while the latter is straightforward and requires an extension of the field space to supermanifolds.
2) Facilitate the adoption of these techniques in phenomenology studies, allowing to deal with more compact expressions in terms of the geometrical objects, which makes the calculations with higher-dimensional operators trivial.

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