

## **Festina-Lente Bound on Higgs vacuum structure, inflation, and dark photon**

*Thursday, 15 June 2023 16:30 (20 minutes)*

The recently suggested Festina-Lente (FL) bound provides a lower bound on the masses of  $U(1)$  charged particles in terms of the positive vacuum energy. Since the charged particle masses in the Standard Model (SM) are generated by the Higgs mechanism, the FL bound provides a testbed of consistent Higgs potentials in the current dark energy-dominated universe as well as during inflation. We study the implications of the FL bound on the UV behavior of the Higgs potential for a miniscule vacuum energy, as in the current universe. We also present values of the Hubble parameter and the Higgs vacuum expectation value allowed by the FL bound during inflation, which implies that the Higgs cannot stay at the electroweak scale during this epoch. We also discuss dark photon physics.

### **Secondary category for the parallel session (optional)**

Cosmology

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**Session Classification:** Parallel: BSM Theories and Flavor Physics

**Track Classification:** Parallel Sessions: BSM Theories