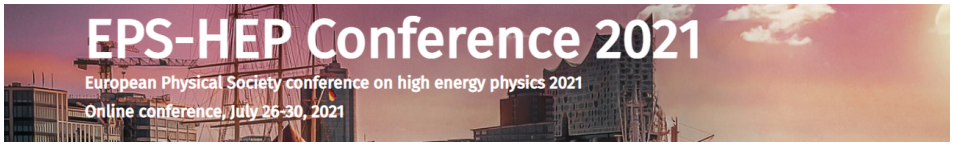

Contribution ID: **306** Type: **Parallel session talk**

New physics explanations of a_μ in light of the FNAL muon $g-2$ measurement

Wednesday 28 July 2021 10:15 (15 minutes)

The Fermilab Muon $g-2$ experiment reported the results of its Run-1 measurement of the anomalous magnetic moment $a_\mu^{\rm FNAL}$, which is in full agreement with the previous BNL measurement and pushes the world average deviation Δa_μ^{2021} from the Standard Model to a significance of 4.2σ. In this talk I will present an extensive survey of its impact on beyond the Standard Model physics, based on the work in Ref. [1]. In this work we used state-of-the-art calculations and a sophisticated set of tools to make predictions for a_μ, dark matter and LHC searches. We examined a wide range of simple models with up to three new fields, that represent some of the few ways that large Δa_μ can be explained. The results show that the new measurement excludes a large number of models and provides crucial constraints on others. Generally, these models provide viable explanations of the a_μ result only by using rather small masses and/or large couplings with chirality flip enhancements, which can lead to conflicts with limits from LHC and dark matter experiments. I will present results for a range of models including scalar leptoquarks and simple models constructed to explain dark matter and g-2 simultaneously.

[1] Athron P, Balázs C, Jacob D H, Kotlarski W, Stöckinger D and Stöckinger-Kim H 2021 (Preprint 2104.03691)

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