Cosmology, Astrophysics, Theory and Collider Higgs 2024 (CATCH22+2)

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## Exclusion bounds for Z' bosons

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We study how the recent experimental results constrain the gauge sectors of U(1) extensions of the standard model using a novel representation of the parameter space. We determine the bounds on the mixing angle between the massive gauge bosons, or equivalently, the new gauge coupling as a function of the mass  $M_{Z'}$  of the new neutral gauge boson Z' in the approximate range  $(10^{-2}, 10^4) \setminus \text{GeV}/c^2$ . We consider the most stringent bounds obtained from direct searches for the Z'. We also exhibit the allowed parameter space by comparing the predicted and measured values of the  $\rho$  parameter and those of the mass of the W boson. Finally, we discuss the prospects of Z' searches at future colliders. The talk is based on arXiv:2402.14786.

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