

Miami Physics Conference 2022

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Title: Gravitational Wave Probes of Massive Gauge Bosons at the Cosmological Collider

I will talk about extending the reach of the “cosmological collider” for massive gauge boson production during inflation from the CMB scales to the interferometer scales. Considering a Chern-Simons coupling between the gauge bosons and the pseudoscalar inflaton, one of the transverse gauge modes is efficiently produced and its inverse decay leaves imprint in primordial scalar and tensor perturbations. I will talk about the correlation functions of these perturbations and show the updated constraints on the parameter space from CMB observables. I will then extrapolate the tensor power spectrum to smaller scales consistently taking into account the impact of the gauge field on inflationary dynamics. I will show that the presence of massive gauge fields during inflation can be detected from characteristic gravitational wave signals encompassing the whole range of current and planned interferometers.