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Gravitational waves in a bouncing cosmology from gauge field production

We calculate the gravitational waves (GW) spectrum produced in various Early Universe scenarios from gauge field sources, thus generalizing earlier inflationary calculations to bouncing cosmologies. We consider generic couplings between the gauge fields and the scalar field dominating the energy density of the Universe. Due to this coupling a sourced GW spectrum is generated. For certain coupling, the spectrum can be arbitrarily close to scale invariant (still slightly blue), that is distinguishable form the slightly red inflationary one. Hence we have a proof of concept of observable GW on CMB scales in a bouncing cosmology.

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