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Primordial SU(2) Gauge fields and Particle Production in the Early Universe

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Primordial SU(2) gauge fields coupled to axions can contribute to the physics of inflation. Their rich phenomenology and unique observational features, e.g., chiral primordial gravitational waves, turned this class of models to a hot topic of study since their discovery in 2011. In this talk, I will briefly review the models in this class, which so far have been studied in the literature. Then, I will talk about the three different types of particles produced by the SU(2) gauge field in this setup, i.e., scalar, fermion, and spin-2 particles. I will explain how the size of the backreaction constrains the parameter space of the models. Next, I will talk about the chiral gravitational waves and how it is produced by the extra spin-2 particle, which is the generic feature of this class of models. Finally, I will finish my talk by the natural inflationary leptogenesis setting provided by this class as their yet another generous opportunity!

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