

Testing Froggatt-Nielsen flavour models with gravitational waves

Friday, 18 April 2025 14:00 (30 minutes)

I will present a recent work where we assessed the capability of Gravitational Wave (GW) experiments to probe the origin of the flavour sector of the Standard Model. Within the context of the Froggatt-Nielsen mechanism to generate the hierarchical patterns of fermion masses and mixing based on a gauged U(1) flavour symmetry, we investigated the formation of cosmic strings and the resulting GW background (GWB), estimating the sensitivity to the model's parameter space of future GW observatories. Comparing these results with the bounds from low-energy flavour observables, we found that these two types of experimental probes of the model are nicely complementary. In certain scenarios, the combination of flavour constraints and future GW bounds can bring about a complete closure of the parameter space, which (once again) illustrates the potential of GWB searches to test fundamental interactions at ultra-high energy scales beyond the reach of laboratory experiments.

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