



Contribution ID: 661

Type: **Talk in the parallel session**

Gravitational geometric phase

Thursday, 8 July 2021 18:30 (20 minutes)

We show that spinors propagating in curved gravitational background acquire an interaction with spacetime curvature, which leads to a quantum mechanical geometric effect. This is similar to what happens in the case of magnetic fields, known as the Pancharatnam-Berry phase. As the magnetic and gravitational fields have certain similar properties, e.g. both contribute to curvature, this result is not difficult to understand. Interestingly, while spacetime around a rotating black hole offers Aharonov-Bohm and Pancharatnam-Berry both the kinds of geometric effect, a static spacetime offers only the latter. In the bath of primordial black holes, such gravity induced effects could easily be measured due to their smaller radius

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Session Classification: Mathematical Problems of Relativistic Physics: Classical and Quantum

Track Classification: Alternative Theories: Mathematical Problems of Relativistic Physics: Classical and Quantum