Contribution ID: **189** Type: **Poster**

Higher-spin minimal coupling in higher dimensions and 5D on-shell amplitudes

Recent developments in massive on-shell scattering amplitudes in 4D have opened the door to understanding particle physics efficiently and theory-agnostically from an on-shell point-of-view, including on-shell notions of minimal coupling and black holes as elementary particles. Important special structures, like the x-factor, only appear when the masses of the particles look like they come from a tower, which arises from compactifying a 5D theory. We develop the groundwork for an on-shell spinor-helicity formalism for scattering amplitudes in 5 space-time dimensions and present a systematic treatment of on-shell 5D amplitudes of massless particles at tree-level. We discover special structures of 5D massless amplitudes, which generalize the on-shell notion of minimal coupling to 5D, and connect these to massive 4D amplitudes with special kinematics. These structures for higher-spin minimal coupling are different in nature than those of lower spins and have been missed by previous studies of higher-dimensional on-shell amplitudes and have direct implications for the on-shell minimal coupling of 5D massive particles and 5D black objects.

Author: ZHAO, Weiming (Princeton University)

Presenter: ZHAO, Weiming (Princeton University)

Session Classification: Reception & Poster session